Changes for the Better

MITSUBISHI ELECTRIC

HYDROBOX

January 2013

No. OCH532
REVISED EDITION-A

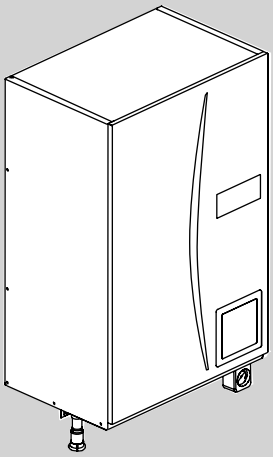
SERVICE MANUAL R410A

[Model name]	[Service Ref.]
EHSC-VM2B	EHSC-VM2B.UK
EHSC-VM6B	EHSC-VM6B.UK
EHSC-YM9B	EHSC-YM9B.UK
EHSC-TM9B	EHSC-TM9B.UK
EHSC-VM6EB	EHSC-VM6EB.UK
EHSC-YM9EB	EHSC-YM9EB.UK
EHPX-VM2B	EHPX-VM2B.UK
EHPX-VM6B	EHPX-VM6B.UK
EHPX-YM9B	EHPX-YM9B.UK
ERSC-VM2B	ERSC-VM2B.UK

Revision:
- EHSC-VM2B.UK and EHSC-TM9B.UK have been added in REVISED EDITION-A.
- Some descriptions have been modified.

- Please void OCH532.

Note:
- This manual describes only service data of Hydrobox.
- RoHS compliant products have <G> mark on the spec name plate.



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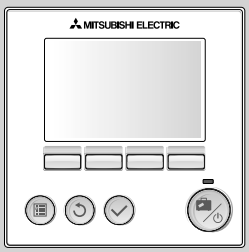


MAIN CONTROLLER

CONTENTS

1. REFERENCE MANUAL ····· 2
2. SAFETY PRECAUTION ····· 3
3. SPECIFICATIONS ····· 6
4. PART NAMES AND FUNCTIONS ····· 7
5. OUTLINES AND DIMENSIONS ····· 11
6. WIRING DIAGRAM ····· 13
7. FIELD WIRING ····· 24
8. WATER SYSTEM DIAGRAM ····· 28
9. CONTROLS ····· 31
10. TROUBLESHOOTING ····· 51
11. DISASSEMBLY PROCEDURE ····· 68
12. SUPPLEMENTARY INFORMATION ····· 82
13. SERVICE AND MAINTENANCE ····· 83

PARTS CATALOG (OCB532)

1 REFERENCE MANUAL

OUTDOOR UNIT'S SERVICE MANUAL

Service Ref.	Service Manual No.
PUHZ-RP35/50/60/71VHA4	OCH451
PUHZ-RP35/50/60/71VHA4R4	
PUHZ-RP100/125/140VKA	
PUHZ-RP100/125/140YKA	
PUHZ-RP100/125/140YKAR4	
PUHZ-HRP71/100VHA	OCH425
PUHZ-HRP71/100VHA2	
PUHZ-HRP71/100VHA2R1	
PUHZ-HRP100VHA2R2	
PUHZ-HRP100/125YHA	
PUHZ-HRP100/125YHA2	
PUHZ-HRP100/125YHA2R1	
PUHZ-W50/85VHA(-BS)	OCH439
PUHZ-W50/85VHAR1(-BS)	
PUHZ-W50VHAR2(-BS)	
PUHZ-W85VHA2.UK	OCH465
PUHZ-W85VHA2-BS.UK	
PUHZ-HW112/140YHA(-BS)	OCH439
PUHZ-HW112/140YHA2(-BS)	
PUHZ-HW112/140YHA2R1(-BS)	
PUHZ-HW112/140YHA2R3(-BS)	
PUHZ-HW140VHA(-BS)	
PUHZ-HW140VHA2(-BS)	
PUHZ-HW140VHA2R1(-BS)	
PUHZ-HW140VHA2R2-BS	
PUHZ-HW140VHA2R3(-BS)	
PUHZ-SW40/45VHA(-BS)	OCH525
PUHZ-SW75/100/120VHA(-BS)	OCH533
PUHZ-SW100/125YHA(-BS)	
PUHZ-SHW80/112VHA	OCH526
PUHZ-SWH112/140YHA	

2 SAFETY PRECAUTION

Please read the following safety precautions carefully.

⚠ WARNING:	⚠ CAUTION:
Precautions that must be observed to prevent injuries or death.	**Precautions that must be observed to prevent damage to unit.**

Mitsubishi Electric is not responsible for the failure of locally-supplied and field-supplied parts.

- **Be sure to perform periodical maintenance.**
- **Be sure to follow your local regulations.**
- **Be sure to follow the instructions provided in this manual.**

⚠ WARNING
Mechanical
The hydrobox and outdoor units must not be installed, disassembled, relocated, altered or repaired by the user. Ask an authorised installer or technician. If the unit is installed improperly or modified after installation by the user water leakage, electric shock or fire may result.
The outdoor unit should be securely fixed to a hard level surface capable of bearing its weight.
The hydrobox should be positioned on a hard vertical surface capable of supporting its filled weight to prevent excessive sound or vibration.
Do not position furniture or electrical appliances below the outdoor unit or hydrobox.
The discharge pipework from the emergency/safety devices of the hydrobox should be installed according to local law.
Only use accessories and replacement parts authorised by Mitsubishi Electric ask a qualified technician to fit the parts.
Electrical
All electrical work should be performed by a qualified technician according to local regulations and the instructions given in this manual.
The units must be powered by a dedicated power supply and the correct voltage and circuit breakers must be used.
Wiring should be in accordance with national wiring regulations. Connections must be made securely and without tension on the terminals.
Earth unit correctly.
General
Keep children and pets away from both the hydrobox and outdoor units.
Do not use the hot water produced by the heat pump directly for drinking or cooking. This could cause illness to the user.
Do not stand on the units.
Do not touch switches with wet hands.
Annual maintenance checks on both the hydrobox and the outdoor unit should be done by qualified person.
Do not place contains with liquids in on top of the hydrobox. If they leak or spill onto the hydrobox damage to the unit and/or fire could occur.
Do not place any heavy items on top of the hydrobox.
When installing or relocating, or servicing the hydrobox, use only the specified refrigerant (R410A) to charge the refrigerant lines. Do not mix it with any other refrigerant and do not allow air to remain in the lines. If air is mixed with the refrigerant, then it can be the cause of abnormal high pressure in the refrigerant line, and may result in an explosion and other hazards. The use of any refrigerant other than that specified for the system will cause mechanical failure or system malfunction or unit breakdown. In the worst case, this could lead to a serious impediment to securing product safety.
In heating mode, to avoid the heat emitters being damaged by excessively hot water, set the target flow temperature to a minimum of 2ºC below the maximum allowable temperature of all the heat emitters. For Zone2, set the target flow temperature to a minimum of 5ºC below the maximum allowable flow temperature of all the heat emitters in Zone2 circuit.

⚠ CAUTION
Use clean water that meets local quality standards on the primary circuit.
The outdoor unit should be installed in an area with sufficient airflow according to the diagrams in the outdoor unit installation manual.
The hydrobox should be located inside to minimise heat loss.
Water pipe-runs on the primary circuit between outdoor and indoor unit should be kept to a minimum to reduce heat loss.
Ensure condensate from outdoor unit is piped away from the base to avoid puddles of water.
Remove as much air as possible from water circuit.
Refrigerant leakage may cause suffocation. Provide ventilation in accordance with EN378-1.
Be sure to wrap insulation around the piping. Direct contact with the bare piping may result in burns or frostbite.
Never put batteries in your mouth for any reason to avoid accidental ingestion.
Battery ingestion may cause choking and/or poisoning.
Install the unit on a rigid structure to prevent excessive sound or vibration during operation.
If power to the hydrobox is to be turned off (or system switched off) for a long time, the water should be drained.
Preventative measures should be taken against water hammer, such as installing a Water Hammer Arrestor on the primary water circuit, as directed by the manufacturer.
In order to prevent condensation on emitters, adjust flow temperature appropriately and also set the lower limit of the flow temperature on site.

⚠ WARNING (SPLIT MODELS ONLY)

Do not discharge refrigerant into the atmosphere if refrigerant leaks during installation, ventilate the room.

Use appropriate tools for high pressure refrigerant.

When pumping down refrigerant , stop the compressor before disconnecting the refrigerant pipes.

During installation securely fasten the refrigerant pipes before starting the compressor.

Check that refrigerant gas does not leak after the completion of installation.

Use R410A refrigerant only. Do not allow air to enter the lines. Failure to observe these instructions will cause mechanical failure, system failure or, in the worst case, serious breach of product safety.

⚠ CAUTION (SPLIT MODELS ONLY)

<Using R410A refrigerant heat pumps>

Use C1220 copper phosphorus, for copper and copper alloy seamless pipes, to connect the refrigerant pipes. Make sure the insides of the pipes are clean and do not contain any harmful contaminants such as sulfuric compounds, oxidants, debris, or dust. Use pipes with the specified thickness. (Refer to 4.4 in the installation manual.) Note the following if reusing existing pipes that carried R22 refrigerant.
- Replace the existing flare nuts and flare the flared sections again.
- Do not use thin pipes. (Refer to 4.4 in the installation manual.)

Store the pipes to be used during installation indoors and keep both ends of the pipes sealed until just before brazing. (Leave elbow joints, etc. in their packaging.) If dust, debris, or moisture enters the refrigerant lines, oil deterioration or compressor breakdown may result.

Use ester oil, ether oil, alkylbenzene oil (small amount) as the refrigeration oil applied to the flared sections. If mineral oil is mixed in the refrigeration oil, oil deterioration may result.

Do not use refrigerant other than R410A refrigerant. If another refrigerant is used, the chlorine will cause the oil to deteriorate.

Use the following tools specifically designed for use with R410A refrigerant. The following tools are necessary to use R410A refrigerant. Contact your nearest dealer for any questions.

Tools (for R410A)	
Gauge manifold	Flare tool
Charge hose	Size adjustment gauge
Gas leak detector	Vacuum pump adapter
Torque wrench	Electronic refrigerant charging scale

Be sure to use the correct tools. If dust, debris, or moisture enters the refrigerant lines, refrigeration oil deterioration may result.

Do not use a charging cylinder, a cylindrical measuring container, when charging R410A refrigerant gas. If the refrigerant gas is transferred to a charging cylinder, the composition of the refrigerant will change and system efficiency will be reduced.

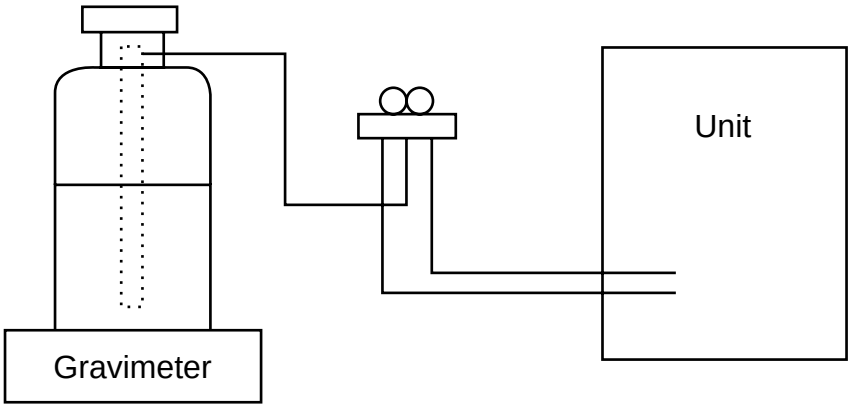
[1] Cautions for service

(1) Perform service after recovering the refrigerant left in unit completely.
(2) Do not release refrigerant in the air.
(3) After completing service, charge the cycle with specified amount of refrigerant.
(4) When performing service, install a filter drier simultaneously.
Be sure to use a filter drier for new refrigerant.

[2] Additional refrigerant charge

When charging directly from refrigerant cylinder

· Check that refrigerant cylinder for R410A on the market is syphon type.
· Charging should be performed with the cylinder of syphon stood vertically. (Refrigerant is charged from liquid phase.)



[3] Service tools

Use the service tools below as exclusive tools for R410A refrigerant.

No.	Tool name	Specifications
①	Gauge manifold	· Only for R410A
		· Use the existing fitting specifications. (UNF1/2)
		· Use high-tension side pressure of 5.3 MPa·G or over.
②	Charge hose	· Only for R410A
		· Use pressure performance of 5.09 MPa·G or over.
③	Electronic scale	—
④	Gas leak detector	· Use the detector for R134a, R407C or R410A
⑤	Adaptor for reverse flow check	· Attach on vacuum pump.
⑥	Refrigerant charge base	—
⑦	Refrigerant cylinder	· Only for R410A ·Top of cylinder (Pink) · Cylinder with syphon
⑧	Refrigerant recovery equipment	—

Model name				EHSC-VM2B	EHSC-VM6B	EHSC-YM9B	EHSC-TM9B	EHSC-VM6EB	EHSC-YM9EB	EHPX-VM2B	EHPX-VM6B	EHPX-YM9B	ERSC-VM2B
Overall unit dimensions (Height×Width×Depth)				800×530×360 mm									860×530×360 mm
Weight (empty)				51 kg	53 kg	53 kg	53 kg	49 kg	49 kg	39 kg	41 kg	41 kg	54 kg
Weight (full)				57 kg	59 kg	59 kg	59 kg	55 kg	55 kg	44 kg	46 kg	46 kg	60 kg
Plate heat exchanger				✓	✓	✓	✓	✓	✓	—	—	—	✓
Cooling mode				NOT available									Available
Unvented expansion vessel (Primary circuit)		Nominal volume		10 L				-		10 L			
		Charge pressure		0.1 MPa (1 bar)				-		0.1 MPa (1 bar)			
Safety device	Water circuit (Primary)	Control thermistor		1 - 80°C									
		Pressure relief valve		0.3 MPa (3 bar)									
		Flow switch		Min flow 5.5 L/min									
	Booster heater	Manual reset thermostat		90°C									
		Thermal cut-out (for dry run prevention)		121°C									
Primary circuit circulating pump				Grundfos UPM2 25 70-180									
Connections		Water		28 mm compression (Primary circuit)									G1 (Male)
		Refrigerant (R410A)	Liquid	9.52 mm						—			9.52 mm
			Gas	15.88 mm						—			15.88 mm
Target temperature range		Flow temperature	Heating	25 - 60°C									
			Cooling	—									5 - 25°C
		Room temperature	Heating	10 - 30°C									
			Cooling	—									Not available
Guaranteed operating range		Ambient *1		0 - 35°C (≤ 80%RH)									
		Outdoor temperature	Heating	See outdoor unit spec table.									
			Cooling	—									See outdoor unit spec table (min. 10°C). *2
Electrical data		Control board	Power supply (Phase, voltage, frequency)	~/N, 230 V, 50 Hz									
			Breaker (*when powered from independent source)	10 A									
		Booster heater	Power supply (Phase, voltage, frequency)	~/N, 230 V, 50 Hz	~/N, 230 V, 50 Hz	3~, 400 V, 50 Hz	3~, 230 V, 50 Hz	~/N, 230 V, 50 Hz	3~, 400 V, 50 Hz	~/N, 230 V, 50 Hz	~/N, 230 V, 50 Hz	3~, 400 V, 50 Hz	~/N, 230 V, 50 Hz
			Capacity	2 kW	2 kW + 4 kW	3 kW + 6 kW	3 kW + 6 kW	2 kW + 4 kW	3 kW + 6 kW	2 kW	2 kW + 4 kW	3 kW + 6 kW	2 kW
			Current	9 A	26 A	13 A	23 A	26 A	13 A	9 A	26 A	13 A	9 A
			Breaker	16 A	32 A	16 A	32 A	32 A	16 A	16 A	32 A	16 A	16 A

<Table 3.1>

Optional extras

- Wireless Remote Controller PAR-WT50R-E
- Wireless Receiver PAR-WR51R-E
- Remote sensor PAC-SE51TS-E
- Tank thermistor (THW5) PAC-TH011TK-E
- Joint pipe (15.88 → 12.7) PAC-SH50RJ-E
- Joint pipe (9.52 → 6.35) PAC-SH30RJ-E
- Thermistor PAC-TH011-E
- High temperature thermistor PAC-TH011HT-E

*1 The environment must be frost-free.

*2 Low ambient cooling is NOT allowed.

4 PART NAMES AND FUNCTIONS

<EHSC-*M*B> (Split model system)

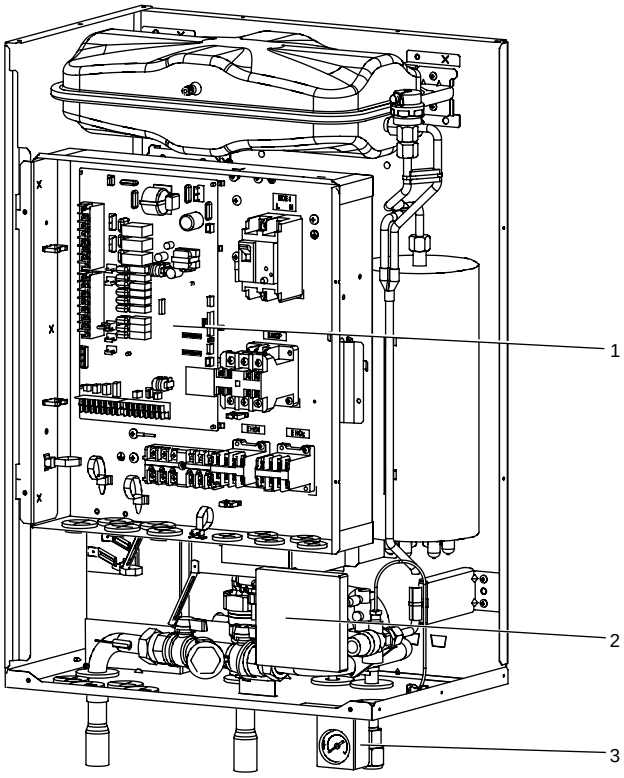


Figure 4-1

Number	Component
1	Control and electrical box
2	Main controller
3	Manometer
4	Expansion vessel
5	Expansion vessel charge valve
6	Automatic air vent
7	Booster heater
8	Drain cock
9	Water circulation pump
10	Pressure relief valve
11	Flow switch
12	Plate heat exchanger
13	Strainer valve
A	Inlet from space heating/Indirect DHW tank (primary return)
B	Outlet to space heating/Indirect DHW tank (primary flow)
C	Refrigerant (Liquid)
D	Refrigerant (Gas)
E	Discharge from pressure relief valve (installer to pipe connect to suitable drain point)

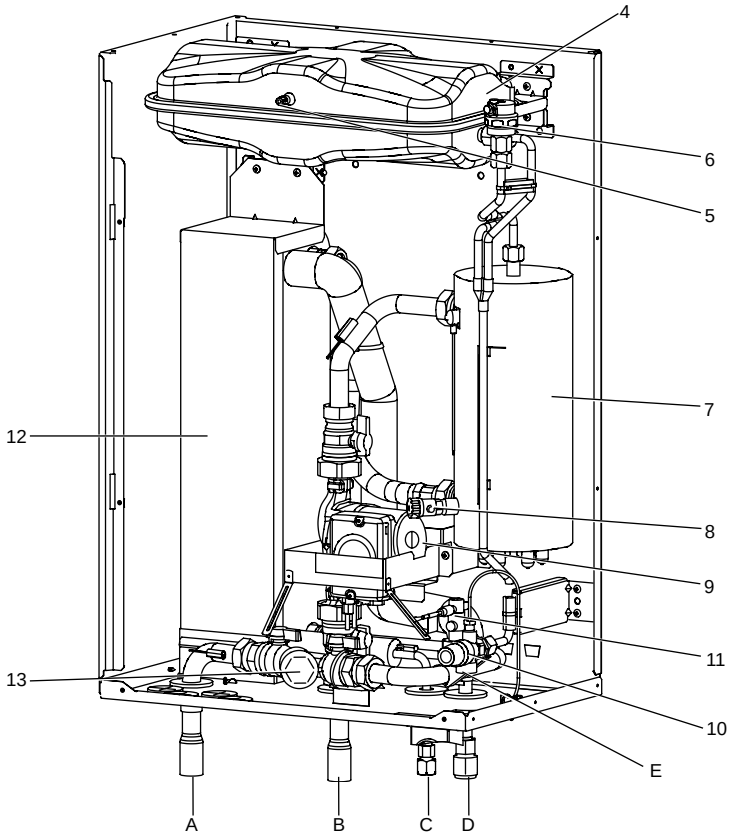


Figure 4-2

<EHSC-*M*EB> (Split model system without expansion vessel)

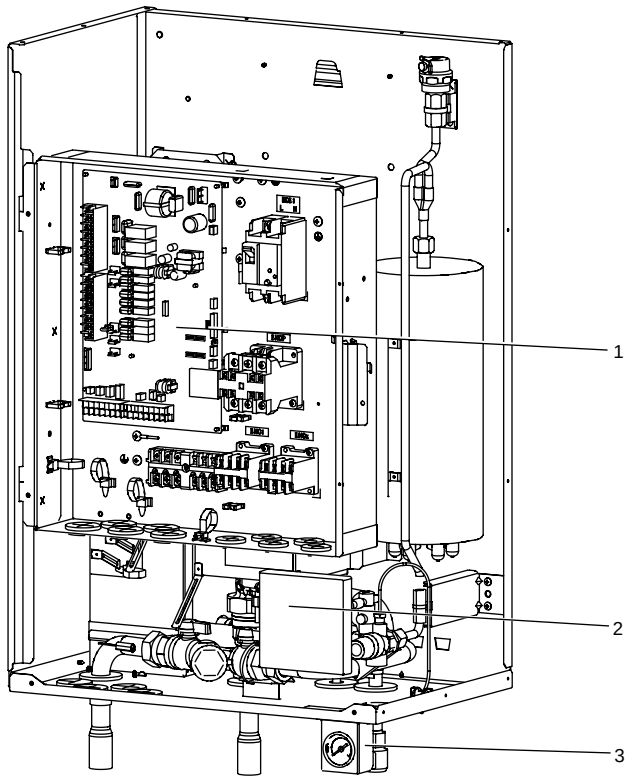


Figure 4-3

Number	Component
1	Control and electrical box
2	Main controller
3	Manometer
6	Automatic air vent
7	Booster heater
8	Drain cock
9	Water circulation pump
10	Pressure relief valve
11	Flow switch
12	Plate heat exchanger
13	Strainer valve
A	Inlet from space heating/Indirect DHW tank (primary return)
B	Outlet to space heating/Indirect DHW tank (primary flow)
C	Refrigerant (Liquid)
D	Refrigerant (Gas)
E	Discharge from pressure relief valve (installer to pipe connect to suitable drain point)

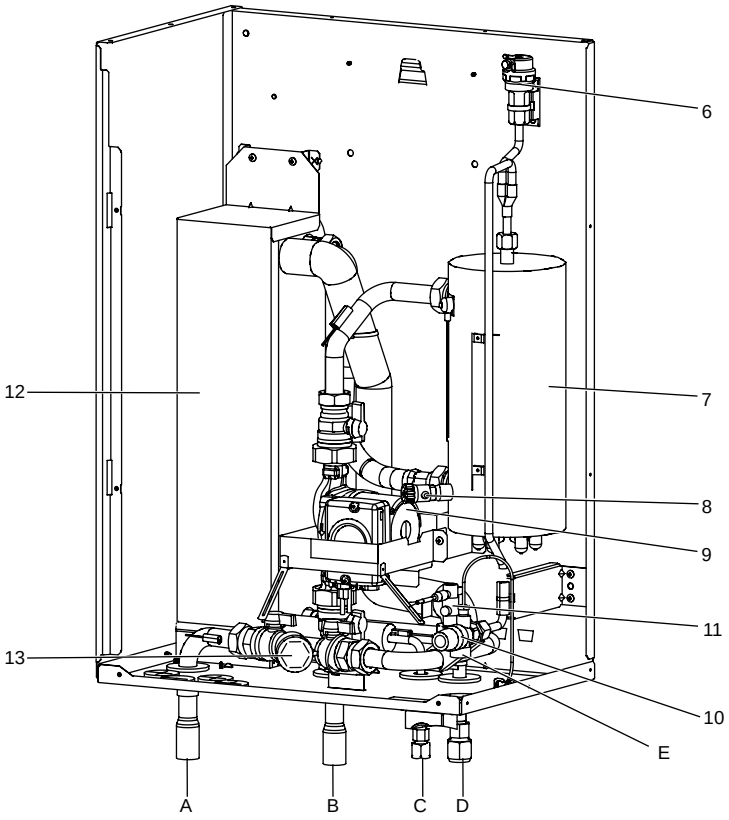


Figure 4-4

***For installation of this model, make sure to install a primary-side expansion vessel in the field. (Refer to installation manual, Figure 4.3.3.)**

<EHPX> (Packaged model system)

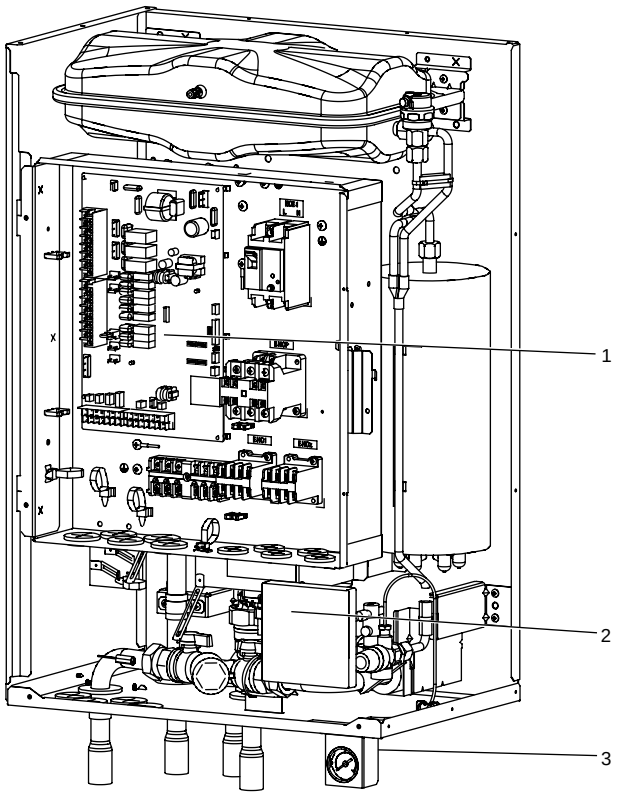


Figure 4-5

Number	Component
1	Control and electrical box
2	Main controller
3	Manometer
4	Expansion vessel
5	Expansion vessel charge valve
6	Automatic air vent
7	Booster heater
8	Drain cock
9	Water circulation pump
10	Pressure relief valve
11	Flow switch
13	Strainer valve
A	Inlet from space heating/Indirect DHW tank (primary return)
B	Inlet from heat pump
C	Outlet to heat pump
D	Outlet to space heating/Indirect DHW tank (primary flow)
E	Discharge from pressure relief valve (installer to pipe connect to suitable drain point)

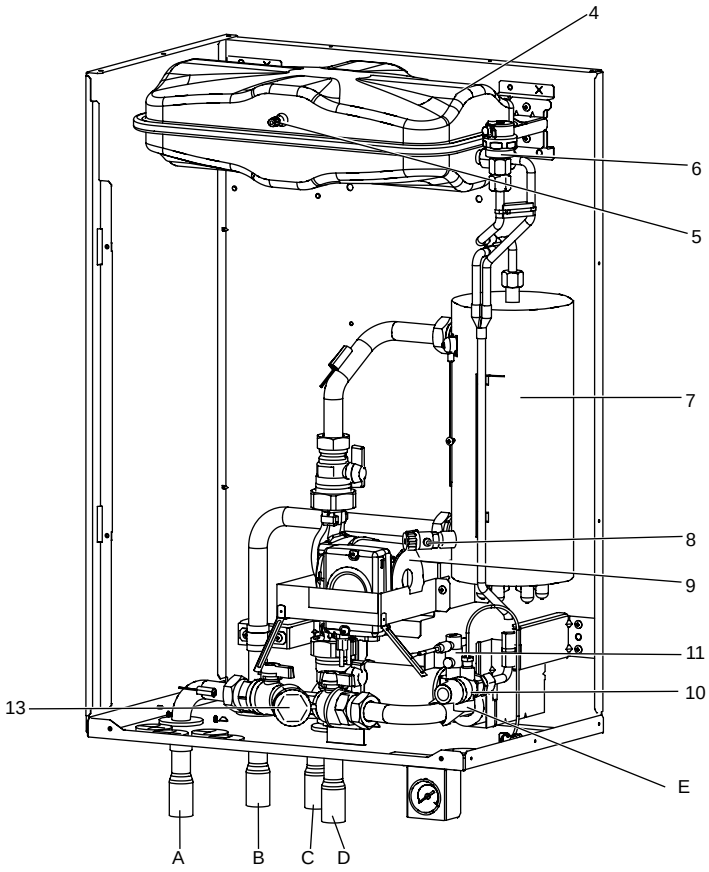


Figure 4-6

<ERSC> (Split model system for heating and cooling)

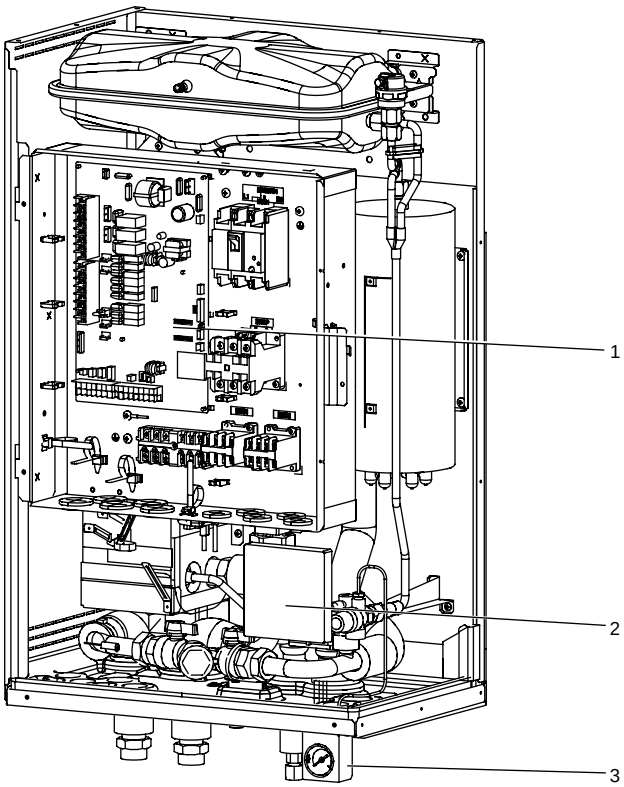


Figure 4-7

Number	Component
1	Control and electrical box
2	Main controller
3	Manometer
4	Expansion vessel
5	Expansion vessel charge valve
6	Automatic air vent
7	Booster heater
8	Drain cock
9	Water circulation pump
10	Pressure relief valve
11	Flow switch
12	Plate heat exchanger
13	Strainer valve
14	Drain pan
A	Inlet from space heating/Indirect DHW tank (primary return)
B	Outlet to space heating/Indirect DHW tank (primary flow)
C	Refrigerant (Liquid)
D	Refrigerant (Gas)
E	Discharge from pressure relief valve (installer to pipe connect to suitable drain point)

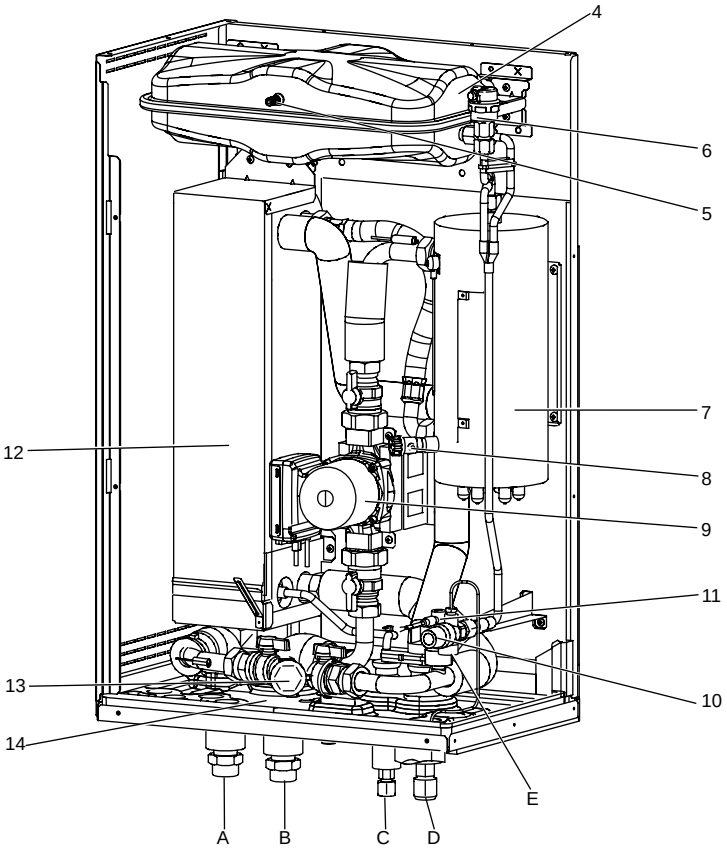


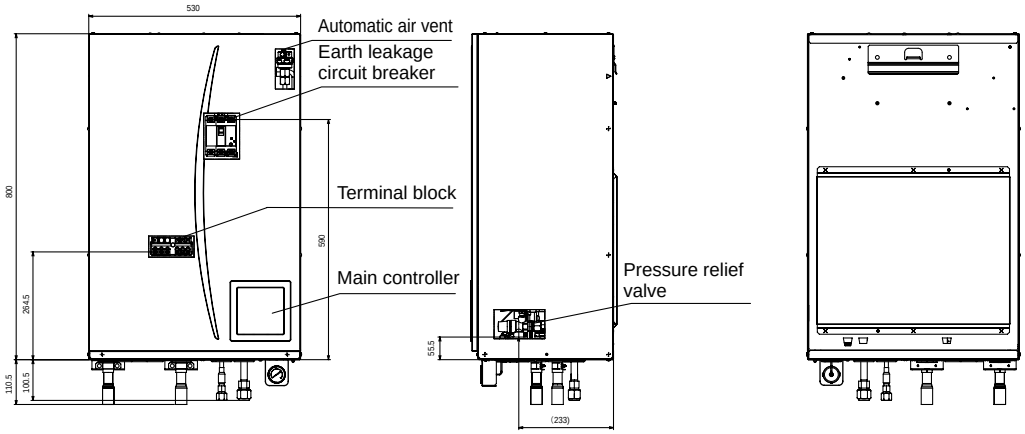
Figure 4-8

5 OUTLINES AND DIMENSIONS

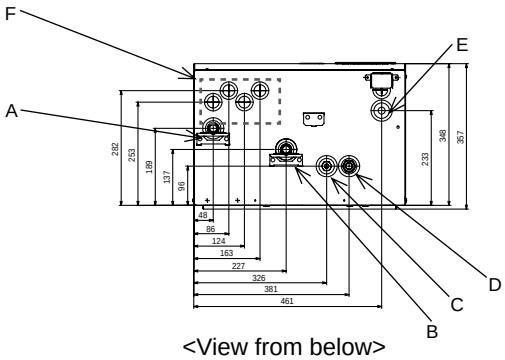
5-1. Technical Drawings

(Unit: mm)

<EHSC> (Split model system)



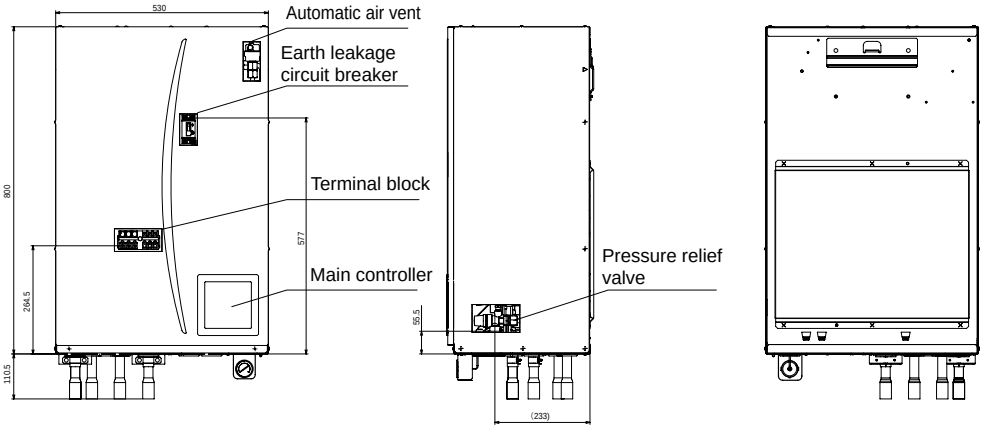
<Front> <Side> <Rear>



<View from below>

Letter	Pipe description	Connection size/type
A	Space heating/Indirect DHW tank (primary) return connection	28 mm/Compression
B	Space heating/Indirect DHW tank (primary) flow connection	28 mm/Compression
C	Refrigerant (Liquid)	9.52 mm/Flare
D	Refrigerant (Gas)	15.88 mm/Flare
E	Discharge pipe (by installer) from pressure relief valve	G1/2" female (valve port within hydrobox casing)
F	Electrical cable inlets ① ② ③ ④	— For inlets ① and ②, run low-voltage wires including external input wires and thermistor wires. For inlets ③ and ④, run high-voltage wires including power cable, indoor-outdoor cable, and external output wires. *For a wireless receiver (option) cable, use inlet ①.

<EHPX> (Packaged model system)



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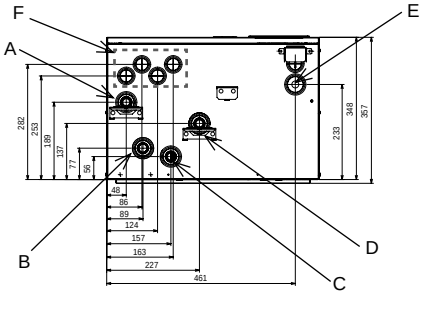
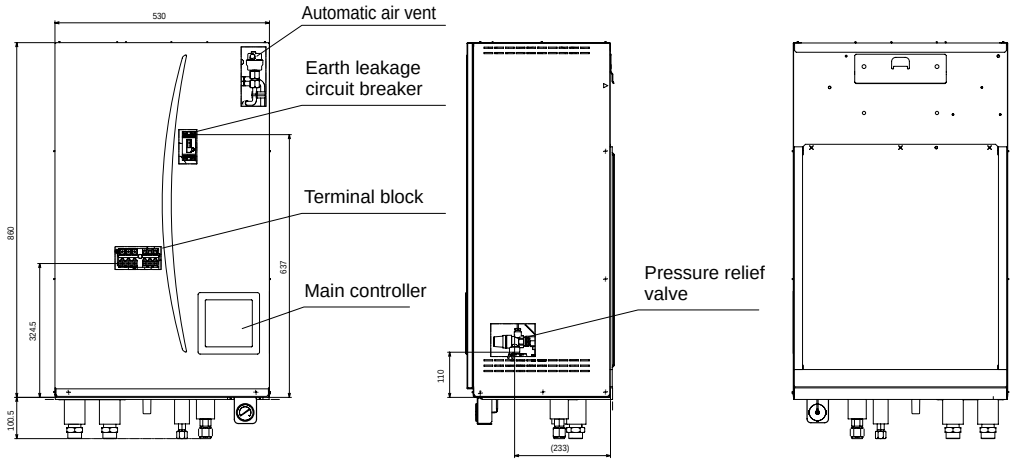


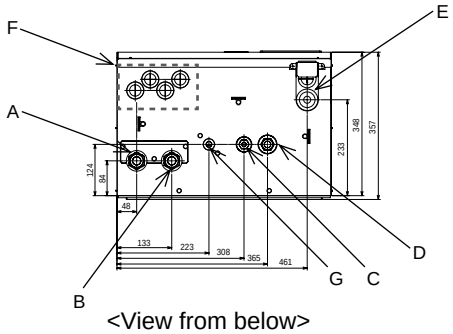
<View from below>

Letter	Pipe description	Connection size/type
A	Space heating/Indirect DHW tank (primary) return connection	28 mm/Compression
B	Flow connection from heat pump	28 mm/Compression
C	Return connection to heat pump	28 mm/Compression
D	Space heating/Indirect DHW tank (primary) flow connection	28 mm/Compression
E	Discharge pipe (by installer) from pressure relief valve	G1/2" female (valve port within hydrobox casing)
F	Electrical cable inlets ① ② ③ ④	— For inlets ① and ②, run low-voltage wires including external input wires and thermistor wires. For inlets ③ and ④, run high-voltage wires including power cable, indoor-outdoor cable, and external output wires. *For a wireless receiver (option) cable, use inlet ①.

<ERSC> (Split model system)



<Front> <Right side> <Rear>



<View from below>

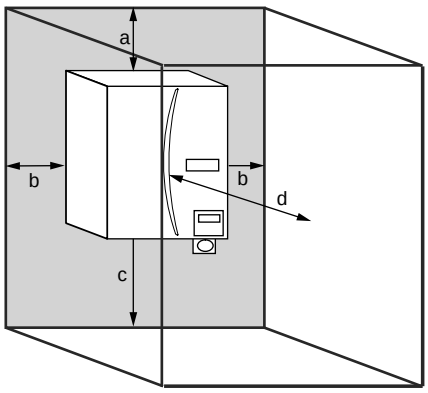
Letter	Pipe description	Connection size/type
A	Space heating and cooling/ Indirect DHW tank (primary) return connection	G1 nut
B	Space heating and cooling/ Indirect DHW tank (primary) flow connection	G1 nut
C	Refrigerant (Liquid)	9.52 mm/Flare
D	Refrigerant (Gas)	15.88 mm/Flare
E	Discharge pipe (by installer) from pressure relief valve	G1/2" female (valve port within hydrobox casing)
F	Electrical cable inlets ① ② ③ ④	— For inlets ① and ②, run low-voltage wires including external input wires and thermistor wires. For inlets ③ and ④, run high-voltage wires including power cable, indoor-outdoor cable, and external output wires. *For a wireless receiver (option) cable, use inlet ①.
G	Drain socket	O.D. ø20

5-2. Service access diagrams

Service access	
Parameter	Dimension (mm)
a	200
b	150
c	500
d	500

Sufficient space MUST be left for the provision of discharge pipework as detailed in National and Local building regulations.

The hydrobox must be located indoors and in a frost-free environment, for example in a utility room.



Service access

6 WIRING DIAGRAM

6-1. EHSC-VM2B

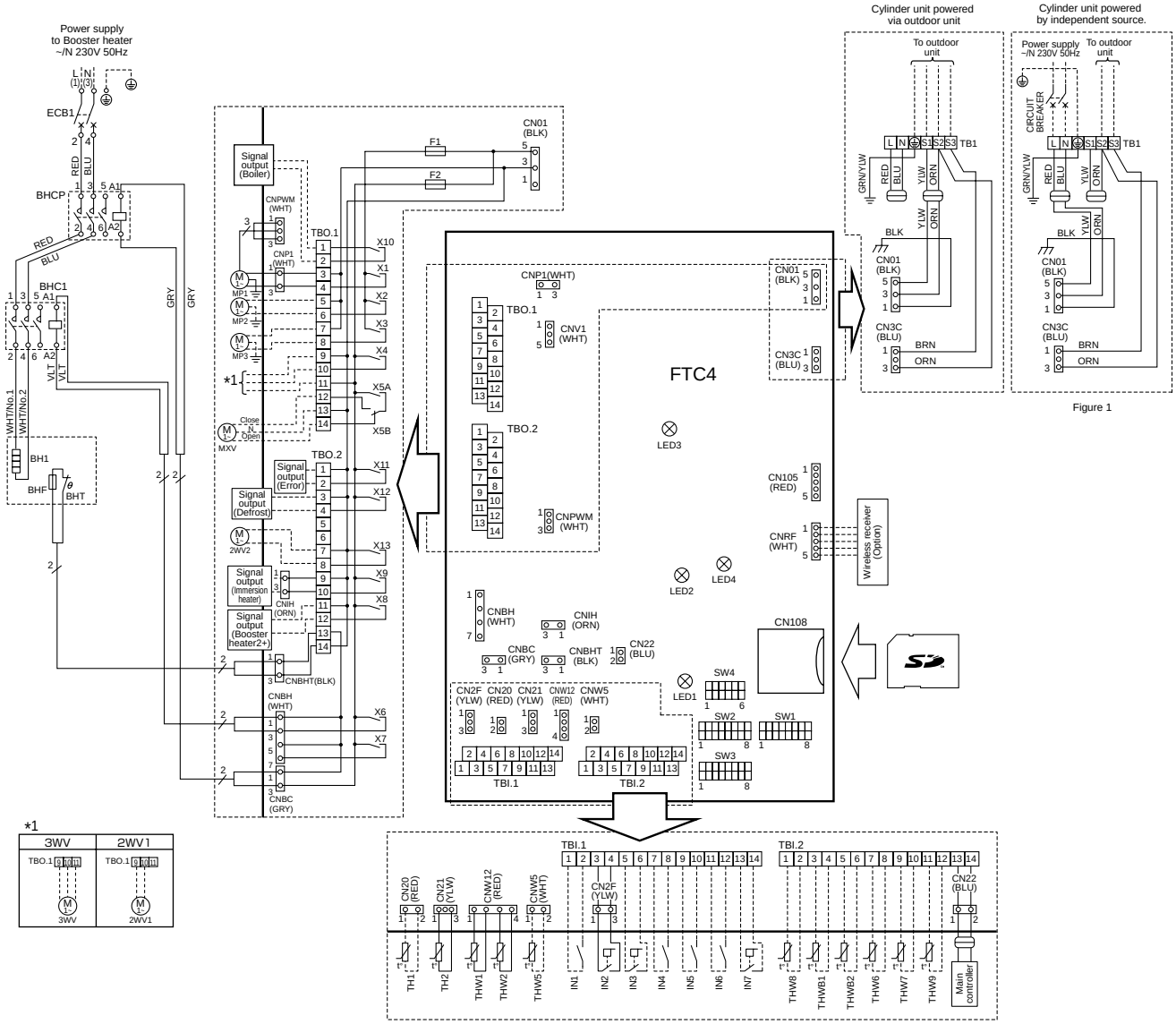


Figure 1

Table 1 Signal Inputs

Name	Terminal block	Connector	Item	OFF (Open)	ON (Short)
IN1	TBI.1 1-2	—	Room thermostat 1 input	Refer to SW2-1 in <6-11 Dip switch setting>	
IN2	TBI.1 3-4	CN2F	Flow switch 1 input	Refer to SW2-2 in <6-11 Dip switch setting>	
IN3	TBI.1 5-6	—	Flow switch 2 input (Zone1)	Refer to SW3-2 in <6-11 Dip switch setting>	
IN4	TBI.1 7-8	—	Demand control input	Normal	Heat source OFF/Boiler operation *2
IN5	TBI.1 9-10	—	Outdoor thermostat input *1	Standard operation	Heater operation/Boiler operation *2
IN6	TBI.1 11-12	—	Room thermostat 2 input	Refer to SW3-1 in <6-11 Dip switch setting>	
IN7	TBI.1 13-14	—	Flow switch 3 input (Zone2)	Refer to SW3-3 in <6-11 Dip switch setting>	

*1. If using outdoor thermostat for controlling operation of heaters, the lifetime of the heaters and related parts may be reduced.
*2. To turn on the boiler operation, use the main controller to select “Boiler” in “External/input setting“ screen in the service menu.

Table 2 Outputs

Name	Terminal block	Connector	Item	OFF	ON
OUT1	TBO.1 3-4	CNP1	Water circulation pump 1 output (Space heating & DHW)	OFF	ON
OUT2	TBO.1 5-6	—	Water circulation pump 2 output (Space heating for Zone1)	OFF	ON
OUT3	TBO.1 7-8	—	Water circulation pump 3 output (Space heating for Zone2)	OFF	ON
OUT4	TBO.1 9-11	CNV1	3-way valve (2-way valve1) output	Heating	DHW
OUT5	TBO.1 12-13	—	Mixing valve output	Stop	Close
	TBO.1 13-14			Stop	Open
OUT6	—	CNBH 1-3	Booster heater 1 output	OFF	ON
OUT7	—	CNBH 5-7	Booster heater 2 output	OFF	ON
OUT8	TBO.2 11-12	—	Booster heater 2+ output	OFF	ON
OUT9	TBO.2 9-10	CNIH	Immersion heater output	OFF	ON
OUT10	TBO.1 1-2	—	Boiler output	OFF	ON
OUT11	TBO.2 1-2	—	Error output	Normal	Error
OUT12	TBO.2 3-4	—	Defrost output	Normal	Defrost
OUT13	TBO.2 7-8	—	2-way valve 2 output	DHW	Heating

Symbol	Name
TB1	Terminal block <Power supply, Outdoor unit>
ECB1	Earth leakage circuit breaker for booster heater
MP1	Water circulation pump1(Space heating & DHW)
MP2	Water circulation pump2 (Space heating for Zone1)(Field supply)
MP3	Water circulation pump3 (Space heating for Zone2)(Field supply)
3WV(2WV1)	3-way valve (2-way valve1)(Field supply)
2WV2	2-way valve2 (Field supply)
MXV	Mixing valve (Field supply)
BHT	Thermostat for booster heater
BHF	Thermal fuse for booster heater
BH1	Booster heater 1
BHC1	Contactor for booster heater 1
BHCP	Contactor for booster heater protection

Symbol	Name
TH1	Thermistor (Room temp.)(Option)
TH2	Thermistor (Ref. liquid temp.)
THW1	Thermistor (Flow water temp.)
THW2	Thermistor (Return water temp.)
THW5	Thermistor (DHW tank water temp.)(Option)
THW6	Thermistor (Zone1 flow temp.)(Option)
THW7	Thermistor (Zone1 return temp.)(Option)
THW8	Thermistor (Zone2 flow temp.)(Option)
THW9	Thermistor (Zone2 return temp.)(Option)
THWB1	Thermistor (Boiler flow temp.)(Option)
THWB2	Thermistor (Boiler return temp.)(Option)
IN1	Room thermostat 1 (Field supply)
IN2	Flow switch 1
IN3	Flow switch 2 (Field supply)
IN4	Demand control (Field supply)
IN5	Outdoor thermostat (Field supply)
IN6	Room thermostat 2 (Field supply)
IN7	Flow switch 3 (Field supply)

FLOW TEMP. CONTROLLER (FTC4)	
TBO.1~2	Terminal block <Outputs>
TBI.1~2	Terminal block <Signal Inputs, Thermistor>
F1~F2	Fuse (T6.3AL250V)
SW1~4	Dip switch *See 6-11 Dip switch setting
X1~X13	Relay
LED1	Power supply (FTC4)
LED2	Power supply (Main controller)
LED3	Communication (FTC4-Outdoor unit)
LED4	Reading or writing data to SD card
CNPWM	Pump speed control signal for MP1
CN108	SD card connector

1. Symbols used in wiring diagram are,
   ⊙⊙ : connector, □□□ : terminal block.
2. Indoor unit and outdoor unit connecting wires have polarities, make sure to match terminal numbers (S1, S2, S3) for correct wirings,
3. Since the outdoor unit side electric wiring may change, be sure to check the outdoor unit electric wiring diagram for servicing.
4. This diagram shows the wiring of indoor unit and outdoor unit connecting wires (specification of 230V), adopting superimposed system of power and signal.
   When work to supply power separately to indoor unit and outdoor unit was applied, refer to Figure 1.

6-2. EHSC-VM6B

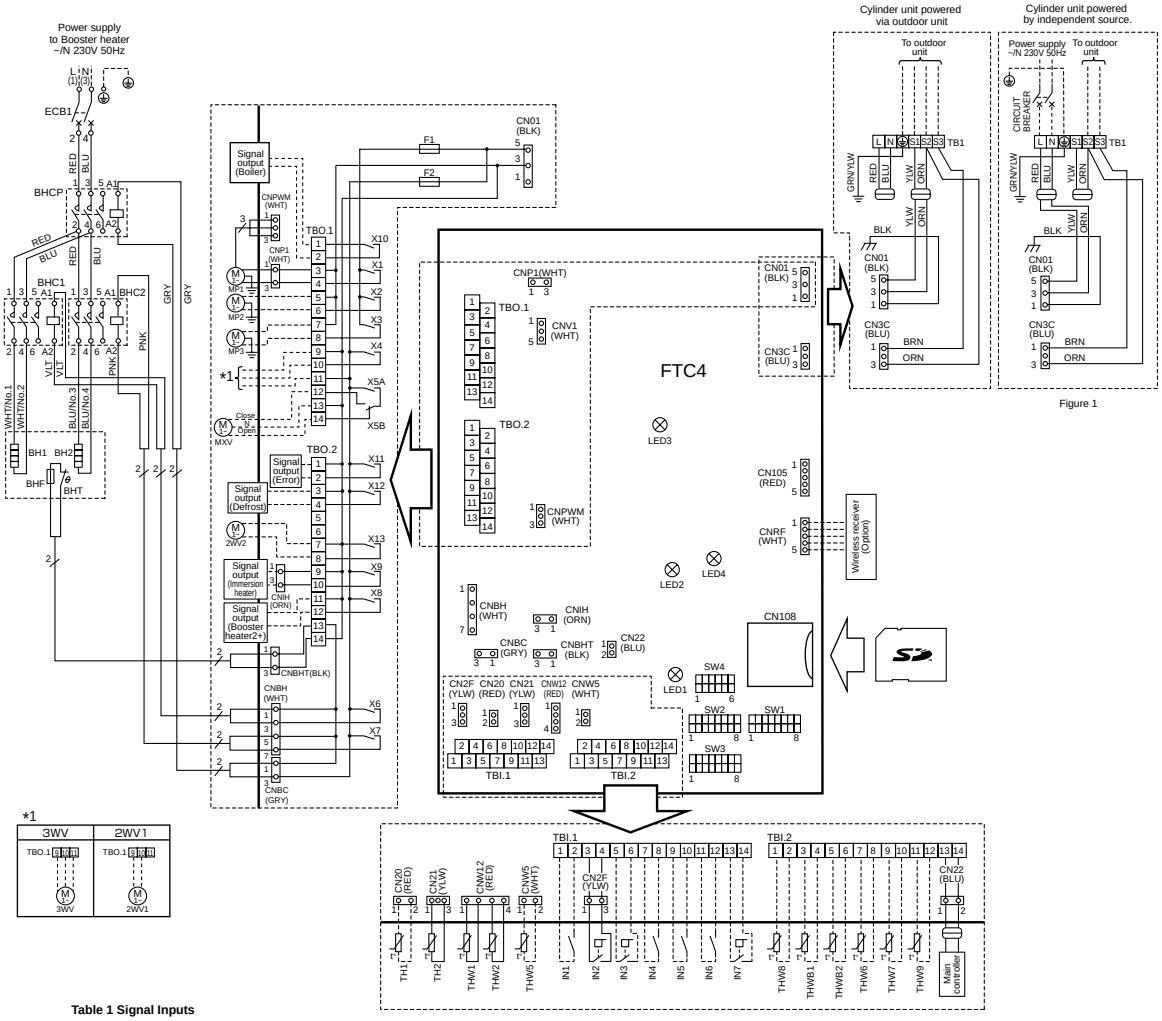


Figure 1

Table 1 Signal Inputs

Name	Terminal block	Connector	Item	OFF (Open)	ON (Short)
IN1	TBI.1 1-2	—	Room thermostat 1 input	Refer to SW2-1 in <6-11 Dip switch setting>	
IN2	TBI.1 3-4	CN2F	Flow switch 1 input	Refer to SW2-2 in <6-11 Dip switch setting>	
IN3	TBI.1 5-6	—	Flow switch 2 input (Zone1)	Refer to SW3-2 in <6-11 Dip switch setting>	
IN4	TBI.1 7-8	—	Demand control input	Normal	Heat source OFF/Boiler operation *2
IN5	TBI.1 9-10	—	Outdoor thermostat input *1	Standard operation	Heater operation/Boiler operation *2
IN6	TBI.1 11-12	—	Room thermostat 2 input	Refer to SW3-1 in <6-11 Dip switch setting>	
IN7	TBI.1 13-14	—	Flow switch 3 input (Zone2)	Refer to SW3-3 in <6-11 Dip switch setting>	

*1. If using outdoor thermostat for controlling operation of heaters, the lifetime of the heaters and related parts may be reduced.
*2. To turn on the boiler operation, use the main controller to select “Boiler” in “External/input setting“ screen in the service menu.

Table 2 Outputs

Name	Terminal block	Connector	Item	OFF	ON
OUT1	TBO.1 3-4	CNP1	Water circulation pump 1 output (Space heating & DHW)	OFF	ON
OUT2	TBO.1 5-6	—	Water circulation pump 2 output (Space heating for Zone1)	OFF	ON
OUT3	TBO.1 7-8	—	Water circulation pump 3 output (Space heating for Zone2)	OFF	ON
OUT4	TBO.1 9-11	CNV1	3-way valve (2-way valve1) output	Heating	DHW
OUT5	TBO.1 12-13	—	Mixing valve output	Stop	Close
	TBO.1 13-14			Stop	Open
OUT6	—	CNBH 1-3	Booster heater 1 output	OFF	ON
OUT7	—	CNBH 5-7	Booster heater 2 output	OFF	ON
OUT8	TBO.2 11-12	—	Booster heater 2+ output	OFF	ON
OUT9	TBO.2 9-10	CNIH	Immersion heater output	OFF	ON
OUT10	TBO.1 1-2	—	Boiler output	OFF	ON
OUT11	TBO.2 1-2	—	Error output	Normal	Error
OUT12	TBO.2 3-4	—	Defrost output	Normal	Defrost
OUT13	TBO.2 7-8	—	2-way valve 2 output	DHW	Heating

Symbol	Name
TB1	Terminal block <Power supply, Outdoor unit>
ECB1	Earth leakage circuit breaker for booster heater
MP1	Water circulation pump1(Space heating & DHW)
MP2	Water circulation pump2 (Space heating for Zone1)(Field supply)
MP3	Water circulation pump3 (Space heating for Zone2)(Field supply)
3WV(2WV1)	3-way valve (2-way valve1)(Field supply)
2WV2	2-way valve2 (Field supply)
MXV	Mixing valve (Field supply)
BHT	Thermostat for booster heater
BHF	Thermal fuse for booster heater
BH1	Booster heater 1
BH2	Booster heater 2
BHC1	Contactor for booster heater 1
BHC2	Contactor for booster heater 2
BHCP	Contactor for booster heater protection

Symbol	Name
TH1	Thermistor (Room temp.)(Option)
TH2	Thermistor (Ref. liquid temp.)
THW1	Thermistor (Flow water temp.)
THW2	Thermistor (Return water temp.)
THW5	Thermistor (DHW tank water temp.)(Option)
THW6	Thermistor (Zone1 flow temp.)(Option)
THW7	Thermistor (Zone1 return temp.)(Option)
THW8	Thermistor (Zone2 flow temp.)(Option)
THW9	Thermistor (Zone2 return temp.)(Option)
THWB1	Thermistor (Boiler flow temp.)(Option)
THWB2	Thermistor (Boiler return temp.)(Option)
IN1	Room thermostat 1 (Field supply)
IN2	Flow switch 1
IN3	Flow switch 2 (Field supply)
IN4	Demand control (Field supply)
IN5	Outdoor thermostat (Field supply)
IN6	Room thermostat 2 (Field supply)
IN7	Flow switch 3 (Field supply)

FLOW TEMP. CONTROLLER (FTC4)	
TBO.1~2	Terminal block <Outputs>
TBI.1~2	Terminal block <Signal Inputs, Thermistor>
F1~F2	Fuse (T6.3AL250V)
SW1~4	Dip switch *See 6-11 Dip switch setting
X1~X12	Relay
LED1	Power supply (FTC4)
LED2	Power supply (Main controller)
LED3	Communication (FTC4-Outdoor unit)
LED4	Reading or writing data to SD card
CNPWM	Pump speed control signal for MP1
CN108	SD card connector

1. Symbols used in wiring diagram are, ⊙⊙ : connector, ▭▭▭ : terminal block.
2. Indoor unit and outdoor unit connecting wires have polarities, make sure to match terminal numbers (S1, S2, S3) for correct wirings,
3. Since the outdoor unit side electric wiring may change, be sure to check the outdoor unit electric wiring diagram for servicing.
4. This diagram shows the wiring of indoor unit and outdoor unit connecting wires (specification of 230V), adopting superimposed system of power and signal. When work to supply power separately to indoor unit and outdoor unit was applied, refer to Figure 1.

6-3. EHSC-YM9B

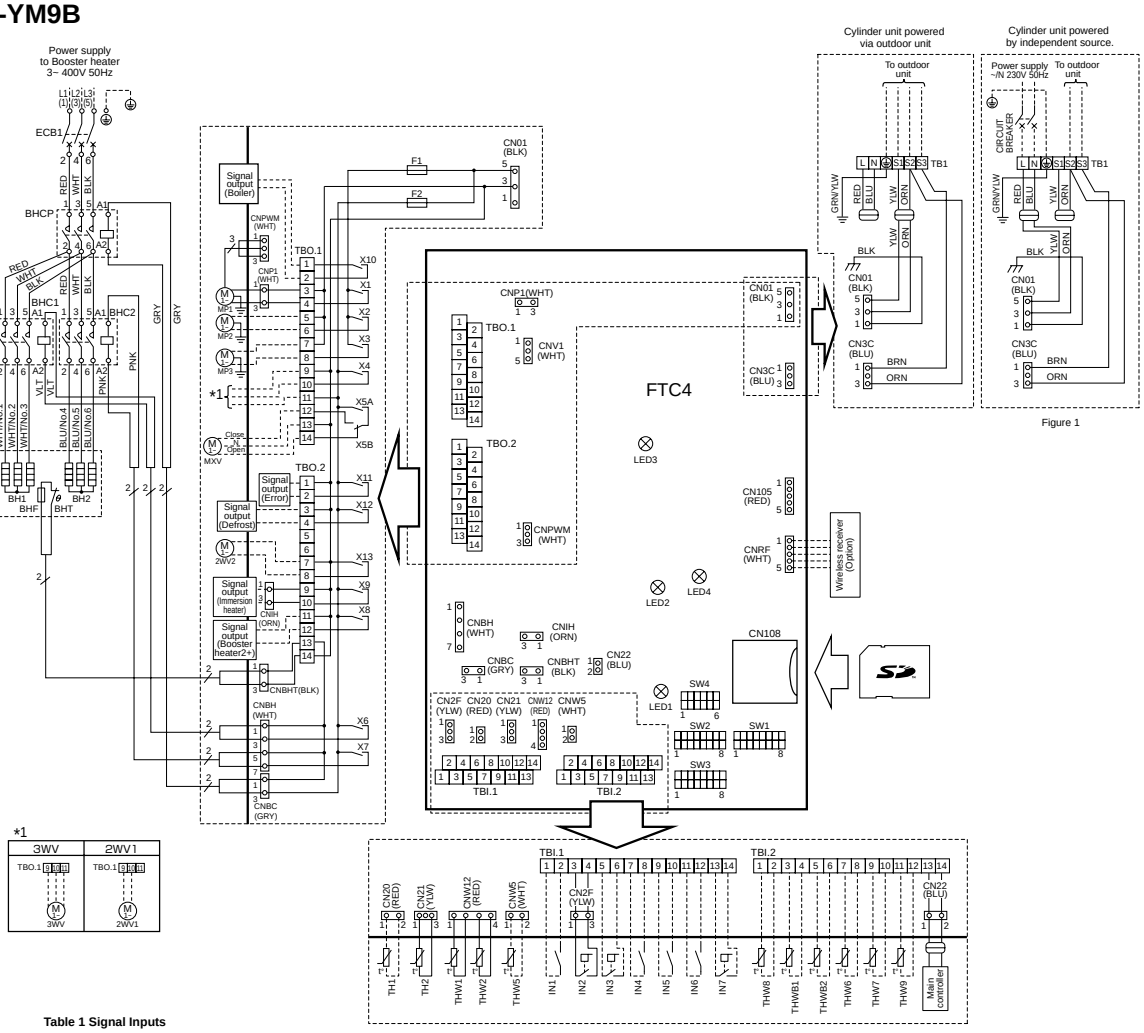


Table 1 Signal Inputs

Name	Terminal block	Connector	Item	OFF (Open)	ON (Short)
IN1	TBI.1 1-2	—	Room thermostat 1 input	Refer to SW2-1 in <6-11 Dip switch setting>	
IN2	TBI.1 3-4	CN2F	Flow switch 1 input	Refer to SW2-2 in <6-11 Dip switch setting>	
IN3	TBI.1 5-6	—	Flow switch 2 input (Zone1)	Refer to SW3-2 in <6-11 Dip switch setting>	
IN4	TBI.1 7-8	—	Demand control input	Normal	Heat source OFF/Boiler operation *2
IN5	TBI.1 9-10	—	Outdoor thermostat input *1	Standard operation	Heater operation/Boiler operation *2
IN6	TBI.1 11-12	—	Room thermostat 2 input	Refer to SW3-1 in <6-11 Dip switch setting>	
IN7	TBI.1 13-14	—	Flow switch 3 input (Zone2)	Refer to SW3-3 in <6-11 Dip switch setting>	

*1. If using outdoor thermostat for controlling operation of heaters, the lifetime of the heaters and related parts may be reduced.
*2. To turn on the boiler operation, use the main controller to select “Boiler” in “External/input setting“ screen in the service menu.

Table 2 Outputs

Name	Terminal block	Connector	Item	OFF	ON
OUT1	TBO.1 3-4	CNP1	Water circulation pump 1 output (Space heating & DHW)	OFF	ON
OUT2	TBO.1 5-6	—	Water circulation pump 2 output (Space heating for Zone1)	OFF	ON
OUT3	TBO.1 7-8	—	Water circulation pump 3 output (Space heating for Zone2)	OFF	ON
OUT4	TBO.1 9-11	CNV1	3-way valve (2-way valve1) output	Heating	DHW
OUT5	TBO.1 12-13	—	Mixing valve output	Stop	Close
	TBO.1 13-14			Stop	Open
OUT6	—	CNBH 1-3	Booster heater 1 output	OFF	ON
OUT7	—	CNBH 5-7	Booster heater 2 output	OFF	ON
OUT8	TBO.2 11-12	—	Booster heater 2+ output	OFF	ON
OUT9	TBO.2 9-10	CNIH	Immersion heater output	OFF	ON
OUT10	TBO.1 1-2	—	Boiler output	OFF	ON
OUT11	TBO.2 1-2	—	Error output	Normal	Error
OUT12	TBO.2 3-4	—	Defrost output	Normal	Defrost
OUT13	TBO.2 7-8	—	2-way valve 2 output	DHW	Heating

Symbol	Name
TB1	Terminal block <Power supply, Outdoor unit>
ECB1	Earth leakage circuit breaker for booster heater
MP1	Water circulation pump1(Space heating & DHW)
MP2	Water circulation pump2 (Space heating for Zone1)(Field supply)
MP3	Water circulation pump3 (Space heating for Zone2)(Field supply)
3WV(2WV1)	3-way valve (2-way valve1)(Field supply)
2WV2	2-way valve2 (Field supply)
MXV	Mixing valve (Field supply)
BHT	Thermostat for booster heater
BHF	Thermal fuse for booster heater
BH1	Booster heater 1
BH2	Booster heater 2
BHC1	Contactor for booster heater 1
BHC2	Contactor for booster heater 2
BHCP	Contactor for booster heater protection

Symbol	Name
TH1	Thermistor (Room temp.)(Option)
TH2	Thermistor (Ref. liquid temp.)
THW1	Thermistor (Flow water temp.)
THW2	Thermistor (Return water temp.)
THW5	Thermistor (DHW tank water temp.)(Option)
THW6	Thermistor (Zone1 flow temp.)(Option)
THW7	Thermistor (Zone1 return temp.)(Option)
THW8	Thermistor (Zone2 flow temp.)(Option)
THW9	Thermistor (Zone2 return temp.)(Option)
THWB1	Thermistor (Boiler flow temp.)(Option)
THWB2	Thermistor (Boiler return temp.)(Option)
IN1	Room thermostat 1 (Field supply)
IN2	Flow switch 1
IN3	Flow switch 2 (Field supply)
IN4	Demand control (Field supply)
IN5	Outdoor thermostat (Field supply)
IN6	Room thermostat 2 (Field supply)
IN7	Flow switch 3 (Field supply)

FLOW TEMP. CONTROLLER (FTC4)	
TBO.1~2	Terminal block <Outputs>
TBI.1~2	Terminal block <Signal Inputs, Thermistor>
F1~F2	Fuse (T6.3AL250V)
SW1~4	Dip switch *See 6-11 Dip switch setting
X1~X12	Relay
LED1	Power supply (FTC4)
LED2	Power supply (Main controller)
LED3	Communication (FTC4-Outdoor unit)
LED4	Reading or writing data to SD card
CNPWM	Pump speed control signal for MP1
CN108	SD card connector

1. Symbols used in wiring diagram are,
   ○○ : connector, □□□ : terminal block.
2. Indoor unit and outdoor unit connecting wires have polarities, make sure to match terminal numbers (S1, S2, S3) for correct wirings,
3. Since the outdoor unit side electric wiring may change, be sure to check the outdoor unit electric wiring diagram for servicing.
4. This diagram shows the wiring of indoor unit and outdoor unit connecting wires (specification of 230V), adopting superimposed system of power and signal. When work to supply power separately to indoor unit and outdoor unit was applied, refer to Figure 1.

6-4. EHSC-TM9B

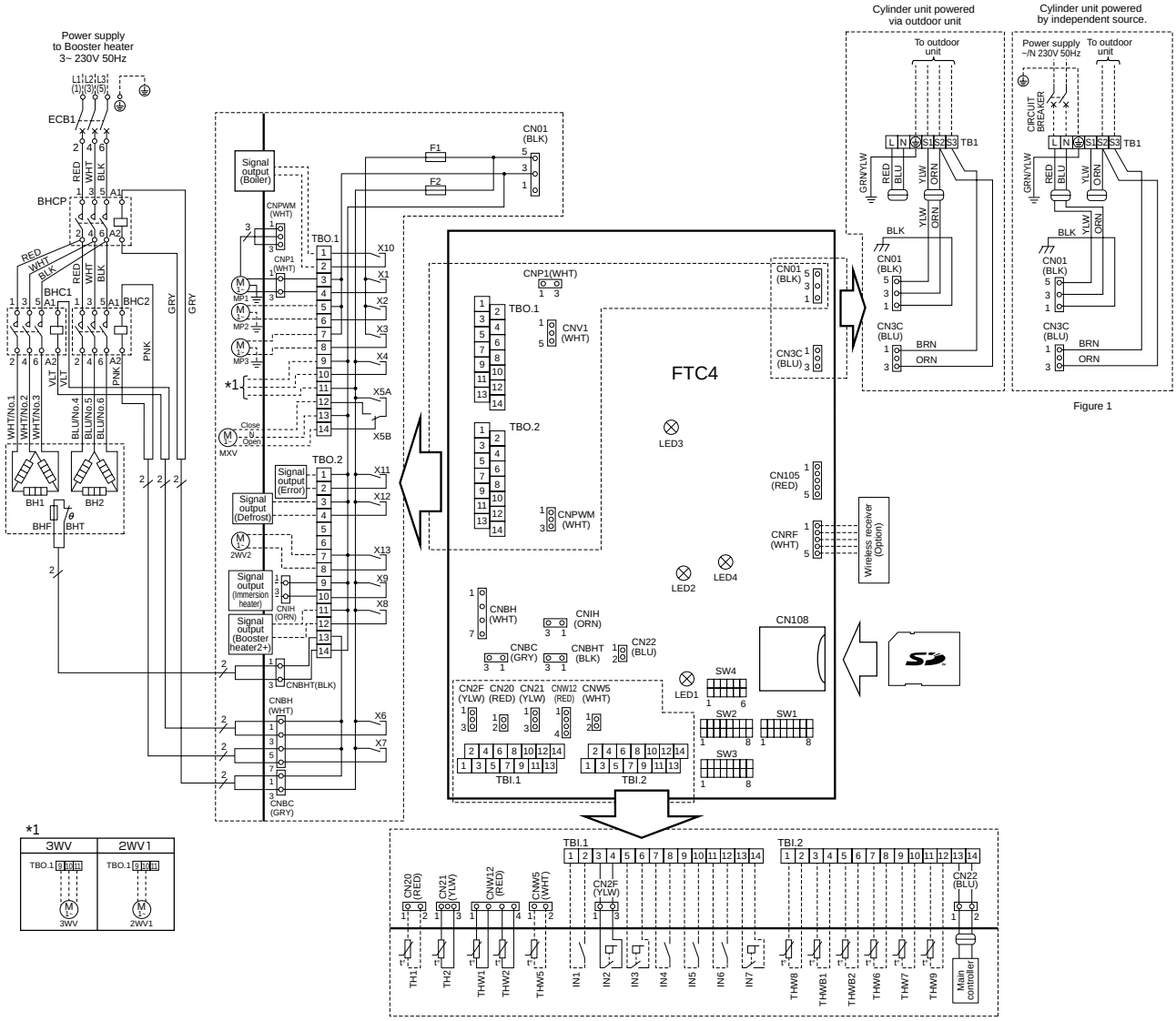


Figure 1

Table 1 Signal Inputs

Name	Terminal block	Connector	Item	OFF (Open)	ON (Short)
IN1	TBI.1 1-2	—	Room thermostat 1 input	Refer to SW2-1 in <6-11 Dip switch setting>	
IN2	TBI.1 3-4	CN2F	Flow switch 1 input	Refer to SW2-2 in <6-11 Dip switch setting>	
IN3	TBI.1 5-6	—	Flow switch 2 input (Zone1)	Refer to SW3-2 in <6-11 Dip switch setting>	
IN4	TBI.1 7-8	—	Demand control input	Normal	Heat source OFF/Boiler operation *2
IN5	TBI.1 9-10	—	Outdoor thermostat input *1	Standard operation	Heater operation/Boiler operation *2
IN6	TBI.1 11-12	—	Room thermostat 2 input	Refer to SW3-1 in <6-11 Dip switch setting>	
IN7	TBI.1 13-14	—	Flow switch 3 input (Zone2)	Refer to SW3-3 in <6-11 Dip switch setting>	

*1. If using outdoor thermostat for controlling operation of heaters, the lifetime of the heaters and related parts may be reduced.
*2. To turn on the boiler operation, use the main controller to select “Boiler” in “External/input setting“ screen in the service menu.

Table 2 Outputs

Name	Terminal block	Connector	Item	OFF	ON
OUT1	TBO.1 3-4	CNP1	Water circulation pump 1 output (Space heating & DHW)	OFF	ON
OUT2	TBO.1 5-6	—	Water circulation pump 2 output (Space heating for Zone1)	OFF	ON
OUT3	TBO.1 7-8	—	Water circulation pump 3 output (Space heating for Zone2)	OFF	ON
OUT4	TBO.1 9-11	CNV1	3-way valve (2-way valve1) output	Heating	DHW
OUT5	TBO.1 12-13	—	Mixing valve output	Stop	Close
	TBO.1 13-14			Stop	Open
OUT6	—	CNBH 1-3	Booster heater 1 output	OFF	ON
OUT7	—	CNBH 5-7	Booster heater 2 output	OFF	ON
OUT8	TBO.2 11-12	—	Booster heater 2+ output	OFF	ON
OUT9	TBO.2 9-10	CNIH	Immersion heater output	OFF	ON
OUT10	TBO.1 1-2	—	Boiler output	OFF	ON
OUT11	TBO.2 1-2	—	Error output	Normal	Error
OUT12	TBO.2 3-4	—	Defrost output	Normal	Defrost
OUT13	TBO.2 7-8	—	2-way valve 2 output	DHW	Heating

Symbol	Name
TB1	Terminal block <Power supply, Outdoor unit>
ECB1	Earth leakage circuit breaker for booster heater
MP1	Water circulation pump1(Space heating & DHW)
MP2	Water circulation pump2 (Space heating for Zone1)(Field supply)
MP3	Water circulation pump3 (Space heating for Zone2)(Field supply)
3WV(2WV1)	3-way valve (2-way valve1)(Field supply)
2WV2	2-way valve2 (Field supply)
MXV	Mixing valve (Field supply)
BHT	Thermostat for booster heater
BHF	Thermal fuse for booster heater
BH1	Booster heater 1
BH2	Booster heater 2
BHC1	Contactor for booster heater 1
BHC2	Contactor for booster heater 2
BHCP	Contactor for booster heater protection

Symbol	Name
TH1	Thermistor (Room temp.)(Option)
TH2	Thermistor (Ref. liquid temp.)
THW1	Thermistor (Flow water temp.)
THW2	Thermistor (Return water temp.)
THW5	Thermistor (DHW tank water temp.)(Option)
THW6	Thermistor (Zone1 flow temp.)(Option)
THW7	Thermistor (Zone1 return temp.)(Option)
THW8	Thermistor (Zone2 flow temp.)(Option)
THW9	Thermistor (Zone2 return temp.)(Option)
THWB1	Thermistor (Boiler flow temp.)(Option)
THWB2	Thermistor (Boiler return temp.)(Option)
IN1	Room thermostat 1 (Field supply)
IN2	Flow switch 1
IN3	Flow switch 2 (Field supply)
IN4	Demand control (Field supply)
IN5	Outdoor thermostat (Field supply)
IN6	Room thermostat 2 (Field supply)
IN7	Flow switch 3 (Field supply)

FLOW TEMP. CONTROLLER (FTC4)	
TB0.1~2	Terminal block <Outputs>
TBI.1~2	Terminal block <Signal Inputs, Thermistor>
F1~F2	Fuse (T6.3AL250V)
SW1~4	Dip switch *See 6-11 Dip switch setting
X1~X13	Relay
LED1	Power supply (FTC4)
LED2	Power supply (Main controller)
LED3	Communication (FTC4-Outdoor unit)
LED4	Reading or writing data to SD card
CNPWM	Pump speed control signal for MP1
CN108	SD card connector

1. Symbols used in wiring diagram are,
   ⊙⊙ : connector, □□□ : terminal block.
2. Indoor unit and outdoor unit connecting wires have polarities, make sure to match terminal numbers (S1, S2, S3) for correct wirings,
3. Since the outdoor unit side electric wiring may change, be sure to check the outdoor unit electric wiring diagram for servicing.
4. This diagram shows the wiring of indoor unit and outdoor unit connecting wires (specification of 230V), adopting superimposed system of power and signal. When work to supply power separately to indoor unit and outdoor unit was applied, refer to Figure 1.

6-5. EHSC-VM6EB

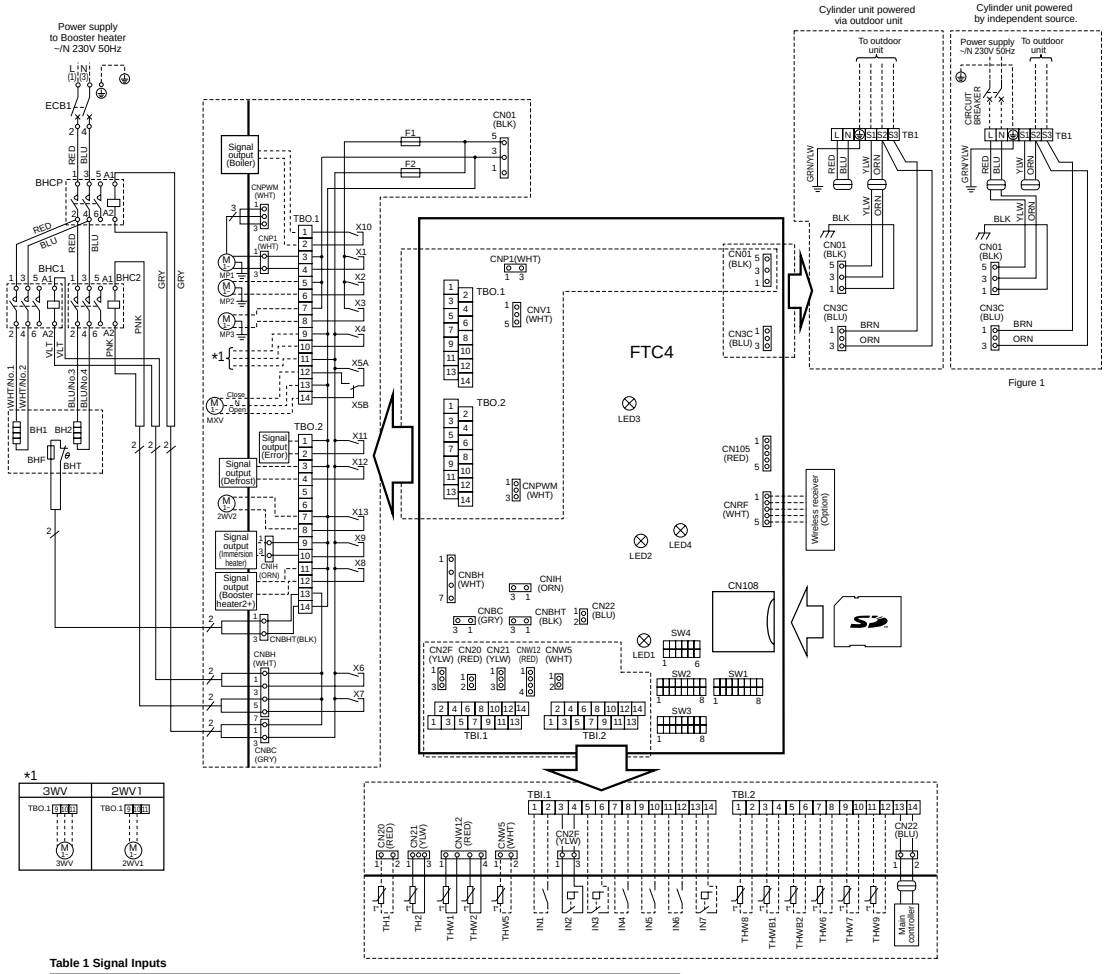


Figure 1

Table 1 Signal Inputs

Name	Terminal block	Connector	Item	OFF (Open)	ON (Short)
IN1	TBI.1 1-2	—	Room thermostat 1 input	Refer to SW2-1 in <6-11 Dip switch setting>	
IN2	TBI.1 3-4	CN2F	Flow switch 1 input	Refer to SW2-2 in <6-11 Dip switch setting>	
IN3	TBI.1 5-6	—	Flow switch 2 input (Zone1)	Refer to SW2-3 in <6-11 Dip switch setting>	
IN4	TBI.1 7-8	—	Demand control input	Normal	Heat source OFF/Boiler operation *2
IN5	TBI.1 9-10	—	Outdoor thermostat input *1	Standard operation	Heater operation/Boiler operation *2
IN6	TBI.1 11-12	—	Room thermostat 2 input	Refer to SW3-1 in <6-11 Dip switch setting>	
IN7	TBI.1 13-14	—	Flow switch 3 input (Zone2)	Refer to SW3-3 in <6-11 Dip switch setting>	

*1. If using outdoor thermostat for controlling operation of heaters, the lifetime of the heaters and related parts may be reduced.
*2. To turn on the boiler operation, use the main controller to select “Boiler” in “External/input setting“ screen in the service menu.

Table 2 Outputs

Name	Terminal block	Connector	Item	OFF	ON
OUT1	TBO.1 3-4	CNP1	Water circulation pump 1 output (Space heating & DHW)	OFF	ON
OUT2	TBO.1 5-6	—	Water circulation pump 2 output (Space heating for Zone1)	OFF	ON
OUT3	TBO.1 7-8	—	Water circulation pump 3 output (Space heating for Zone2)	OFF	ON
OUT4	TBO.1 9-11	CNV1	3-way valve (2-way valve1) output	Heating	DHW
OUT5	TBO.1 12-13	—	Mixing valve output	Stop	Close
	TBO.1 13-14			Stop	Open
OUT6	—	CNBH 1-3	Booster heater 1 output	OFF	ON
OUT7	—	CNBH 5-7	Booster heater 2 output	OFF	ON
OUT8	TBO.2 11-12	—	Booster heater 2+ output	OFF	ON
OUT9	TBO.2 9-10	CNIH	Immersion heater output	OFF	ON
OUT10	TBO.1 1-2	—	Boiler output	OFF	ON
OUT11	TBO.2 1-2	—	Error output	Normal	Error
OUT12	TBO.2 3-4	—	Defrost output	Normal	Defrost
OUT13	TBO.2 7-8	—	2-way valve 2 output	DHW	Heating

Symbol	Name
TB1	Terminal block <Power supply, Outdoor unit>
ECB1	Earth leakage circuit breaker for booster heater
MP1	Water circulation pump1(Space heating & DHW)
MP2	Water circulation pump2 (Space heating for Zone1)(Field supply)
MP3	Water circulation pump3 (Space heating for Zone2)(Field supply)
3WV(2WV1)	3-way valve (2-way valve1)(Field supply)
2WV2	2-way valve2 (Field supply)
MXV	Mixing valve (Field supply)
BHT	Thermostat for booster heater
BHF	Thermal fuse for booster heater
BH1	Booster heater 1
BH2	Booster heater 2
BHC1	Contactor for booster heater 1
BHC2	Contactor for booster heater 2
BHCP	Contactor for booster heater protection

Symbol	Name
TH1	Thermistor (Room temp.)(Option)
TH2	Thermistor (Ref. liquid temp.)
THW1	Thermistor (Flow water temp.)
THW2	Thermistor (Return water temp.)
THW5	Thermistor (DHW tank water temp.)(Option)
THW6	Thermistor (Zone1 flow temp.)(Option)
THW7	Thermistor (Zone1 return temp.)(Option)
THW8	Thermistor (Zone2 flow temp.)(Option)
THW9	Thermistor (Zone2 return temp.)(Option)
THWB1	Thermistor (Boiler flow temp.)(Option)
THWB2	Thermistor (Boiler return temp.)(Option)
IN1	Room thermostat 1 (Field supply)
IN2	Flow switch 1
IN3	Flow switch 2 (Field supply)
IN4	Demand control (Field supply)
IN5	Outdoor thermostat (Field supply)
IN6	Room thermostat 2 (Field supply)
IN7	Flow switch 3 (Field supply)

FLOW TEMP. CONTROLLER (FTC4)	
TBO.1~2	Terminal block <Outputs>
TBI.1~2	Terminal block <Signal Inputs, Thermistor>
F1~F2	Fuse (T6.3AL250V)
SW1~4	Dip switch *See 6-11 Dip switch setting
X1~X12	Relay
LED1	Power supply (FTC4)
LED2	Power supply (Main controller)
LED3	Communication (FTC4-Outdoor unit)
LED4	Reading or writing data to SD card
CNPWM	Pump speed control signal for MP1
CN108	SD card connector

1. Symbols used in wiring diagram are, ⊙⊙ : connector, ▯▯ : terminal block.
2. Indoor unit and outdoor unit connecting wires have polarities, make sure to match terminal numbers (S1, S2, S3) for correct wirings,
3. Since the outdoor unit side electric wiring may change, be sure to check the outdoor unit electric wiring diagram for servicing.
4. This diagram shows the wiring of indoor unit and outdoor unit connecting wires (specification of 230V), adopting superimposed system of power and signal. When work to supply power separately to indoor unit and outdoor unit was applied, refer to Figure 1.

6-6. EHSC-YM9EB

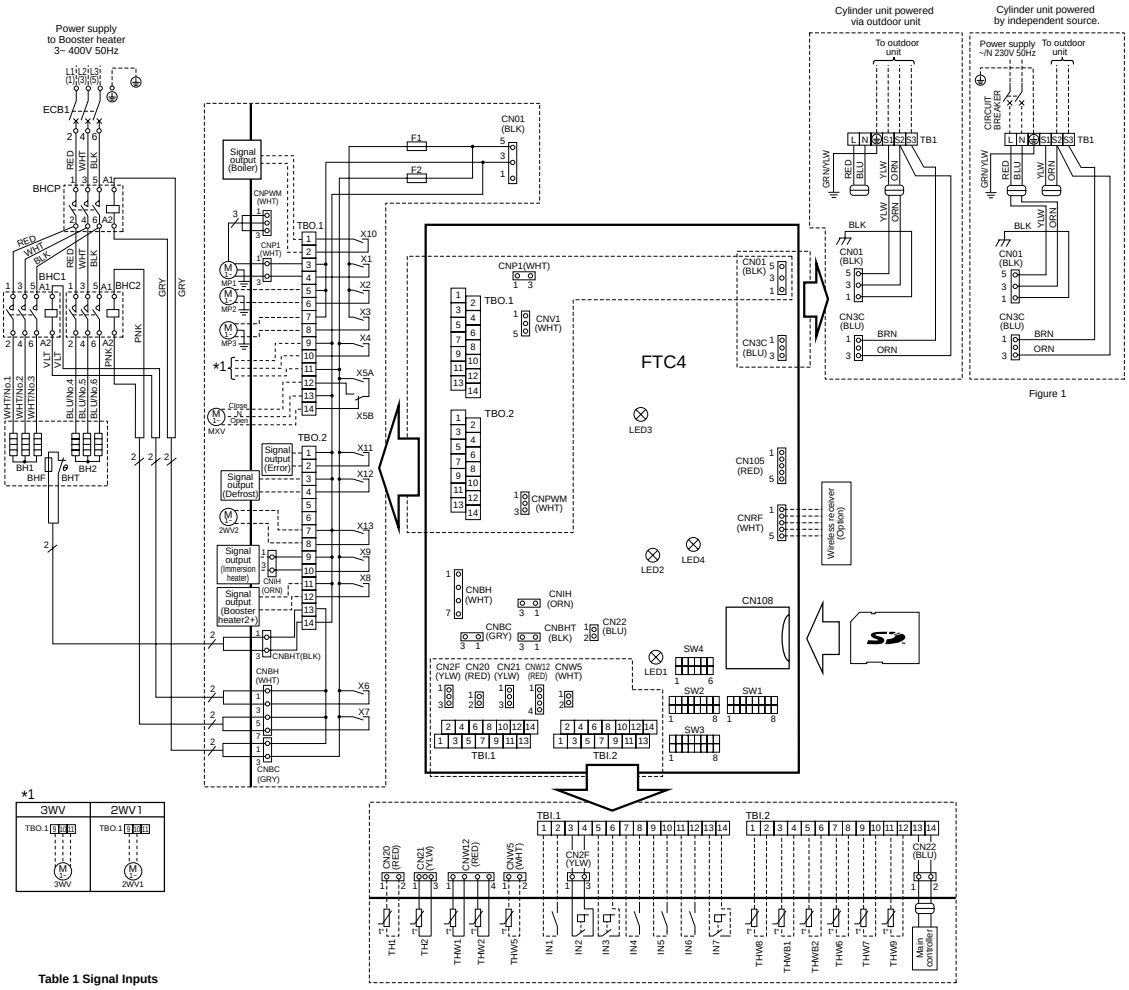

Power supply to Booster heater 3~ 400V 50Hz
Cylinder unit powered via outdoor unit
Cylinder unit powered by independent source.
To outdoor unit
Power supply ~/N 230V 50Hz
FTC4
Wireless receiver (Option)
Figure 1

Table 1 Signal Inputs

Name	Terminal block	Connector	Item	OFF (Open)	ON (Short)
IN1	TBI.1 1-2	—	Room thermostat 1 input	Refer to SW2-1 in <6-11 Dip switch setting>	
IN2	TBI.1 3-4	CN2F	Flow switch 1 input	Refer to SW2-2 in <6-11 Dip switch setting>	
IN3	TBI.1 5-6	—	Flow switch 2 input (Zone1)	Refer to SW3-2 in <6-11 Dip switch setting>	
IN4	TBI.1 7-8	—	Demand control input	Normal	Heat source OFF/Boiler operation *2
IN5	TBI.1 9-10	—	Outdoor thermostat input *1	Standard operation	Heater operation/Boiler operation *2
IN6	TBI.1 11-12	—	Room thermostat 2 input	Refer to SW3-1 in <6-11 Dip switch setting>	
IN7	TBI.1 13-14	—	Flow switch 3 input (Zone2)	Refer to SW3-3 in <6-11 Dip switch setting>	

*1. If using outdoor thermostat for controlling operation of heaters, the lifetime of the heaters and related parts may be reduced.
*2. To turn on the boiler operation, use the main controller to select “Boiler” in “External/input setting“ screen in the service menu.

Table 2 Outputs

Name	Terminal block	Connector	Item	OFF	ON
OUT1	TBO.1 3-4	CNP1	Water circulation pump 1 output (Space heating & DHW)	OFF	ON
OUT2	TBO.1 5-6	—	Water circulation pump 2 output (Space heating for Zone1)	OFF	ON
OUT3	TBO.1 7-8	—	Water circulation pump 3 output (Space heating for Zone2)	OFF	ON
OUT4	TBO.1 9-11	CNV1	3-way valve (2-way valve1) output	Heating	DHW
OUT5	TBO.1 12-13	—	Mixing valve output	Stop	Close
	TBO.1 13-14			Stop	Open
OUT6	—	CNBH 1-3	Booster heater 1 output	OFF	ON
OUT7	—	CNBH 5-7	Booster heater 2 output	OFF	ON
OUT8	TBO.2 11-12	—	Booster heater 2+ output	OFF	ON
OUT9	TBO.2 9-10	CNIH	Immersion heater output	OFF	ON
OUT10	TBO.1 1-2	—	Boiler output	OFF	ON
OUT11	TBO.2 1-2	—	Error output	Normal	Error
OUT12	TBO.2 3-4	—	Defrost output	Normal	Defrost
OUT13	TBO.2 7-8	—	2-way valve 2 output	DHW	Heating

Symbol	Name
TB1	Terminal block <Power supply, Outdoor unit>
ECB1	Earth leakage circuit breaker for booster heater
MP1	Water circulation pump1(Space heating & DHW)
MP2	Water circulation pump2 (Space heating for Zone1)(Field supply)
MP3	Water circulation pump3 (Space heating for Zone2)(Field supply)
3WV(2WV1)	3-way valve (2-way valve1)(Field supply)
2WV2	2-way valve2 (Field supply)
MXV	Mixing valve (Field supply)
BHT	Thermostat for booster heater
BHF	Thermal fuse for booster heater
BH1	Booster heater 1
BH2	Booster heater 2
BHC1	Contactor for booster heater 1
BHC2	Contactor for booster heater 2
BHCP	Contactor for booster heater protection

Symbol	Name
TH1	Thermistor (Room temp.)(Option)
TH2	Thermistor (Ref. liquid temp.)
THW1	Thermistor (Flow water temp.)
THW2	Thermistor (Return water temp.)
THW5	Thermistor (DHW tank water temp.)(Option)
THW6	Thermistor (Zone1 flow temp.)(Option)
THW7	Thermistor (Zone1 return temp.)(Option)
THW8	Thermistor (Zone2 flow temp.)(Option)
THW9	Thermistor (Zone2 return temp.)(Option)
THWB1	Thermistor (Boiler flow temp.)(Option)
THWB2	Thermistor (Boiler return temp.)(Option)
IN1	Room thermostat 1 (Field supply)
IN2	Flow switch 1
IN3	Flow switch 2 (Field supply)
IN4	Demand control (Field supply)
IN5	Outdoor thermostat (Field supply)
IN6	Room thermostat 2 (Field supply)
IN7	Flow switch 3 (Field supply)

FLOW TEMP. CONTROLLER (FTC4)	
TBO.1~2	Terminal block <Outputs>
TBI.1~2	Terminal block <Signal Inputs, Thermistor>
F1~F2	Fuse (T6.3AL250V)
SW1~4	Dip switch *See 6-11 Dip switch setting
X1~X12	Relay
LED1	Power supply (FTC4)
LED2	Power supply (Main controller)
LED3	Communication (FTC4-Outdoor unit)
LED4	Reading or writing data to SD card
CNPWM	Pump speed control signal for MP1
CN108	SD card connector

1. Symbols used in wiring diagram are, ⊡⊡ : connector, ⊡⊡⊡ : terminal block.
2. Indoor unit and outdoor unit connecting wires have polarities, make sure to match terminal numbers (S1, S2, S3) for correct wirings,
3. Since the outdoor unit side electric wiring may change, be sure to check the outdoor unit electric wiring diagram for servicing.
4. This diagram shows the wiring of indoor unit and outdoor unit connecting wires (specification of 230V), adopting superimposed system of power and signal. When work to supply power separately to indoor unit and outdoor unit was applied, refer to Figure 1.

6-7. EHPX-VM2B

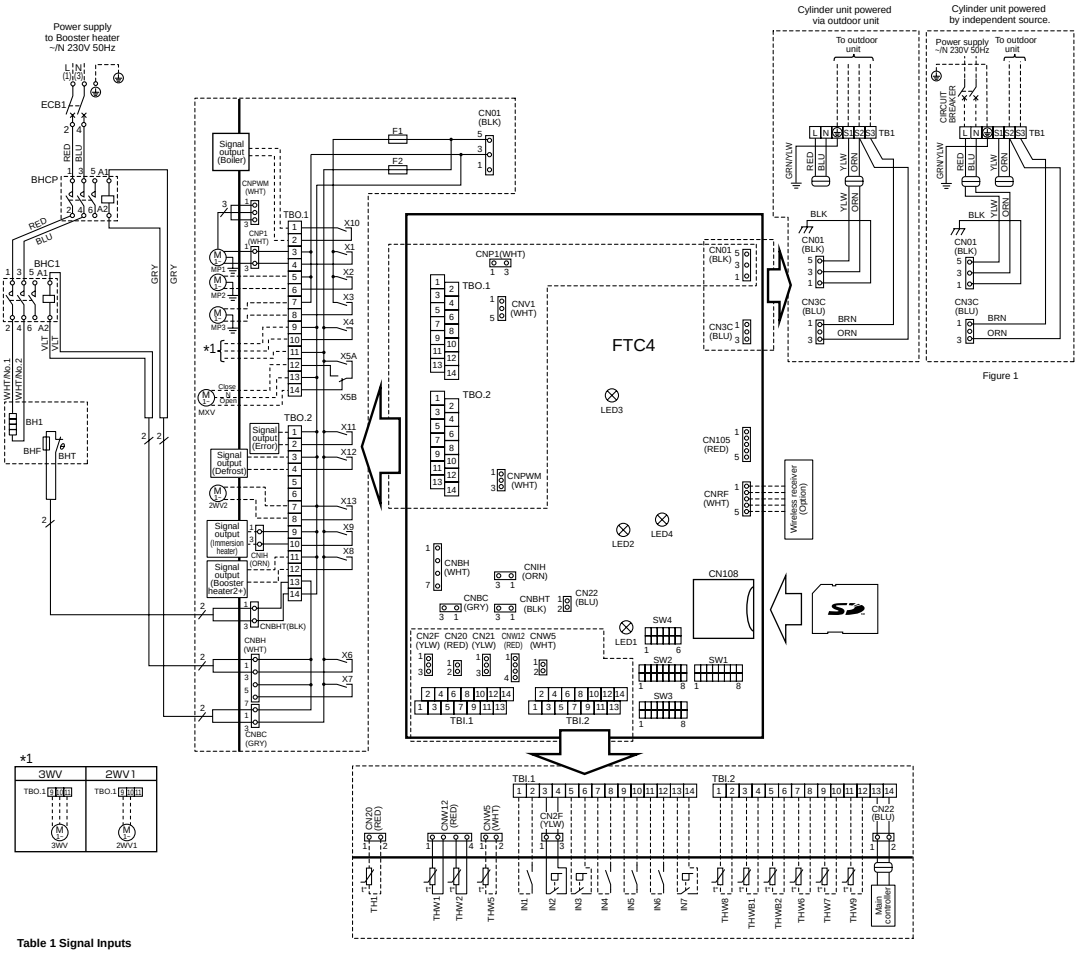


Figure 1

Table 1 Signal Inputs

Name	Terminal block	Connector	Item	OFF (Open)	ON (Short)
IN1	TBI.1 1-2	—	Room thermostat 1 input	Refer to SW2-1 in <6-11 Dip switch setting>	
IN2	TBI.1 3-4	CN2F	Flow switch 1 input	Refer to SW2-2 in <6-11 Dip switch setting>	
IN3	TBI.1 5-6	—	Flow switch 2 input (Zone1)	Refer to SW3-2 in <6-11 Dip switch setting>	
IN4	TBI.1 7-8	—	Demand control input	Normal	Heat source OFF/Boiler operation *2
IN5	TBI.1 9-10	—	Outdoor thermostat input *1	Standard operation	Heater operation/Boiler operation *2
IN6	TBI.1 11-12	—	Room thermostat 2 input	Refer to SW3-1 in <6-11 Dip switch setting>	
IN7	TBI.1 13-14	—	Flow switch 3 input (Zone2)	Refer to SW3-3 in <6-11 Dip switch setting>	

*1. If using outdoor thermostat for controlling operation of heaters, the lifetime of the heaters and related parts may be reduced.
*2. To turn on the boiler operation, use the main controller to select “Boiler” in “External/input setting“ screen in the service menu.

Table 2 Outputs

Name	Terminal block	Connector	Item	OFF	ON
OUT1	TBO.1 3-4	CNP1	Water circulation pump 1 output (Space heating & DHW)	OFF	ON
OUT2	TBO.1 5-6	—	Water circulation pump 2 output (Space heating for Zone1)	OFF	ON
OUT3	TBO.1 7-8	—	Water circulation pump 3 output (Space heating for Zone2)	OFF	ON
OUT4	TBO.1 9-11	CNV1	3-way valve (2-way valve1) output	Heating	DHW
OUT5	TBO.1 12-13 TBO.1 13-14	—	Mixing valve output	Stop Stop	Close Open
OUT6	—	CNBH 1-3	Booster heater 1 output	OFF	ON
OUT7	—	CNBH 5-7	Booster heater 2 output	OFF	ON
OUT8	TBO.2 11-12	—	Booster heater 2+ output	OFF	ON
OUT9	TBO.2 9-10	CNIH	Immersion heater output	OFF	ON
OUT10	TBO.1 1-2	—	Boiler output	OFF	ON
OUT11	TBO.2 1-2	—	Error output	Normal	Error
OUT12	TBO.2 3-4	—	Defrost output	Normal	Defrost
OUT13	TBO.2 7-8	—	2-way valve 2 output	DHW	Heating

Symbol	Name
TB1	Terminal block <Power supply, Outdoor unit>
ECB1	Earth leakage circuit breaker for booster heater
MP1	Water circulation pump1(Space heating & DHW)
MP2	Water circulation pump2 (Space heating for Zone1)(Field supply)
MP3	Water circulation pump3 (Space heating for Zone2)(Field supply)
3WV(2WV1)	3-way valve (2-way valve1)(Field supply)
2WV2	2-way valve2 (Field supply)
MXV	Mixing valve (Field supply)
BHT	Thermostat for booster heater
BHF	Thermal fuse for booster heater
BH1	Booster heater 1
BHC1	Contactor for booster heater 1
BHCP	Contactor for booster heater protection

Symbol	Name
TH1	Thermistor (Room temp.)(Option)
THW1	Thermistor (Flow water temp.)
THW2	Thermistor (Return water temp.)
THW5	Thermistor (DHW tank water temp.)(Option)
THW6	Thermistor (Zone1 flow temp.)(Option)
THW7	Thermistor (Zone1 return temp.)(Option)
THW8	Thermistor (Zone2 flow temp.)(Option)
THW9	Thermistor (Zone2 return temp.)(Option)
THWB1	Thermistor (Boiler flow temp.)(Option)
THWB2	Thermistor (Boiler return temp.)(Option)
IN1	Room thermostat 1 (Field supply)
IN2	Flow switch 1
IN3	Flow switch 2 (Field supply)
IN4	Demand control (Field supply)
IN5	Outdoor thermostat (Field supply)
IN6	Room thermostat 2 (Field supply)
IN7	Flow switch 3 (Field supply)

FLOW TEMP. CONTROLLER (FTC4)	
TBO.1~2	Terminal block <Outputs>
TBI.1~2	Terminal block <Signal Inputs, Thermistor>
F1~F2	Fuse (T6.3AL250V)
SW1~4	Dip switch *See 6-11 Dip switch setting
X1~X12	Relay
LED1	Power supply (FTC4)
LED2	Power supply (Main controller)
LED3	Communication (FTC4-Outdoor unit)
LED4	Reading or writing data to SD card
CNPWM	Pump speed control signal for MP1
CN108	SD card connector

1. Symbols used in wiring diagram are,
   ⊙⊙ : connector, □□□ : terminal block.
2. Indoor unit and outdoor unit connecting wires have polarities, make sure to match terminal numbers (S1, S2, S3) for correct wirings.
3. Since the outdoor unit side electric wiring may change, be sure to check the outdoor unit electric wiring diagram for servicing.
4. This diagram shows the wiring of indoor unit and outdoor unit connecting wires (specification of 230V), adopting superimposed system of power and signal. When work to supply power separately to indoor unit and outdoor unit was applied, refer to Figure 1.

6-8. EHPX-VM6B

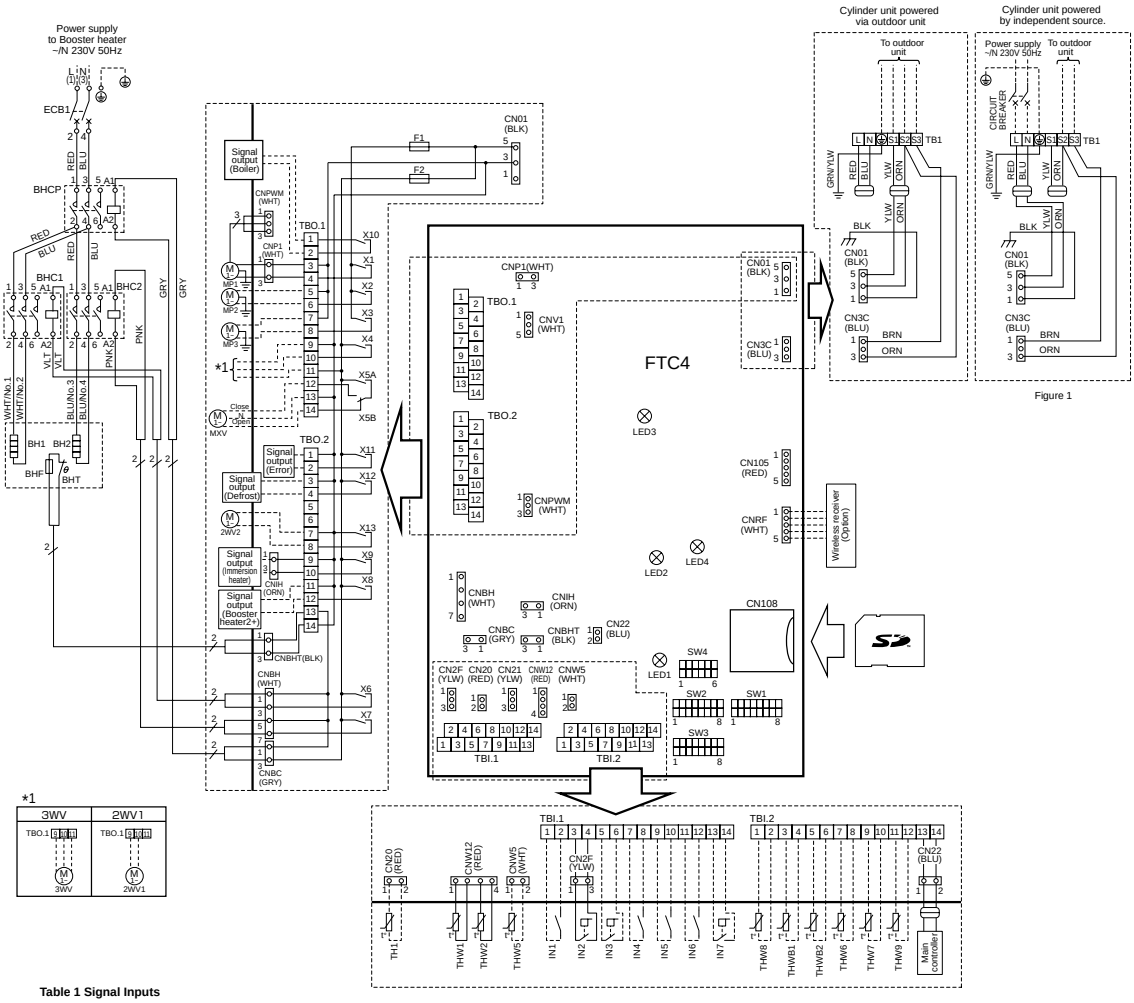


Figure 1

Table 1 Signal Inputs

Name	Terminal block	Connector	Item	OFF (Open)	ON (Short)
IN1	TBI.1 1-2	—	Room thermostat 1 input	Refer to SW2-1 in <6-11 Dip switch setting>	
IN2	TBI.1 3-4	CN2F	Flow switch 1 input	Refer to SW2-2 in <6-11 Dip switch setting>	
IN3	TBI.1 5-6	—	Flow switch 2 input (Zone1)	Refer to SW2-3 in <6-11 Dip switch setting>	
IN4	TBI.1 7-8	—	Demand control input	Normal	Heat source OFF/Boiler operation *2
IN5	TBI.1 9-10	—	Outdoor thermostat input *1	Standard operation	Heater operation/Boiler operation *2
IN6	TBI.1 11-12	—	Room thermostat 2 input	Refer to SW3-1 in <6-11 Dip switch setting>	
IN7	TBI.1 13-14	—	Flow switch 3 input (Zone2)	Refer to SW3-3 in <6-11 Dip switch setting>	

*1. If using outdoor thermostat for controlling operation of heaters, the lifetime of the heaters and related parts may be reduced.
*2. To turn on the boiler operation, use the main controller to select “Boiler” in “External/input setting“ screen in the service menu.

Table 2 Outputs

Name	Terminal block	Connector	Item	OFF	ON
OUT1	TBO.1 3-4	CNP1	Water circulation pump 1 output (Space heating & DHW)	OFF	ON
OUT2	TBO.1 5-6	—	Water circulation pump 2 output (Space heating for Zone1)	OFF	ON
OUT3	TBO.1 7-8	—	Water circulation pump 3 output (Space heating for Zone2)	OFF	ON
OUT4	TBO.1 9-11	CNV1	3-way valve (2-way valve1) output	Heating	DHW
OUT5	TBO.1 12-13 TBO.1 13-14	—	Mixing valve output	Stop Stop	Close Open
OUT6	—	CNBH 1-3	Booster heater 1 output	OFF	ON
OUT7	—	CNBH 5-7	Booster heater 2 output	OFF	ON
OUT8	TBO.2 11-12	—	Booster heater 2+ output	OFF	ON
OUT9	TBO.2 9-10	CNIH	Immersion heater output	OFF	ON
OUT10	TBO.1 1-2	—	Boiler output	OFF	ON
OUT11	TBO.2 1-2	—	Error output	Normal	Error
OUT12	TBO.2 3-4	—	Defrost output	Normal	Defrost
OUT13	TBO.2 7-8	—	2-way valve 2 output	DHW	Heating

Symbol	Name
TB1	Terminal block <Power supply, Outdoor unit>
ECB1	Earth leakage circuit breaker for booster heater
MP1	Water circulation pump1(Space heating & DHW)
MP2	Water circulation pump2 (Space heating for Zone1)(Field supply)
MP3	Water circulation pump3 (Space heating for Zone2)(Field supply)
3WV(2WV1)	3-way valve (2-way valve1)(Field supply)
2WV2	2-way valve2 (Field supply)
MXV	Mixing valve (Field supply)
BHT	Thermostat for booster heater
BHF	Thermal fuse for booster heater
BH1	Booster heater 1
BH2	Booster heater 2
BHC1	Contactor for booster heater 1
BHC2	Contactor for booster heater 2
BHCP	Contactor for booster heater protection

Symbol	Name
TH1	Thermistor (Room temp.)(Option)
THW1	Thermistor (Flow water temp.)
THW2	Thermistor (Return water temp.)
THW5	Thermistor (DHW tank water temp.)(Option)
THW6	Thermistor (Zone1 flow temp.)(Option)
THW7	Thermistor (Zone1 return temp.)(Option)
THW8	Thermistor (Zone2 flow temp.)(Option)
THW9	Thermistor (Zone2 return temp.)(Option)
THWB1	Thermistor (Boiler flow temp.)(Option)
THWB2	Thermistor (Boiler return temp.)(Option)
IN1	Room thermostat 1 (Field supply)
IN2	Flow switch 1
IN3	Flow switch 2 (Field supply)
IN4	Demand control (Field supply)
IN5	Outdoor thermostat (Field supply)
IN6	Room thermostat 2 (Field supply)
IN7	Flow switch 3 (Field supply)

FLOW TEMP. CONTROLLER (FTC4)	
TBO.1~2	Terminal block <Outputs>
TBI.1~2	Terminal block <Signal Inputs, Thermistor>
F1~F2	Fuse (T6.3AL250V)
SW1~4	Dip switch *See 6-11 Dip switch setting
X1~X12	Relay
LED1	Power supply (FTC4)
LED2	Power supply (Main controller)
LED3	Communication (FTC4-Outdoor unit)
LED4	Reading or writing data to SD card
CNPWM	Pump speed control signal for MP1
CN108	SD card connector

1. Symbols used in wiring diagram are,
   ⊙⊙ : connector, □□ : terminal block.
2. Indoor unit and outdoor unit connecting wires have polarities, make sure to match terminal numbers (S1, S2, S3) for correct wirings,
3. Since the outdoor unit side electric wiring may change, be sure to check the outdoor unit electric wiring diagram for servicing.
4. This diagram shows the wiring of indoor unit and outdoor unit connecting wires (specification of 230V), adopting superimposed system of power and signal. When work to supply power separately to indoor unit and outdoor unit was applied, refer to Figure 1.

6-9. EHPX-YM9B

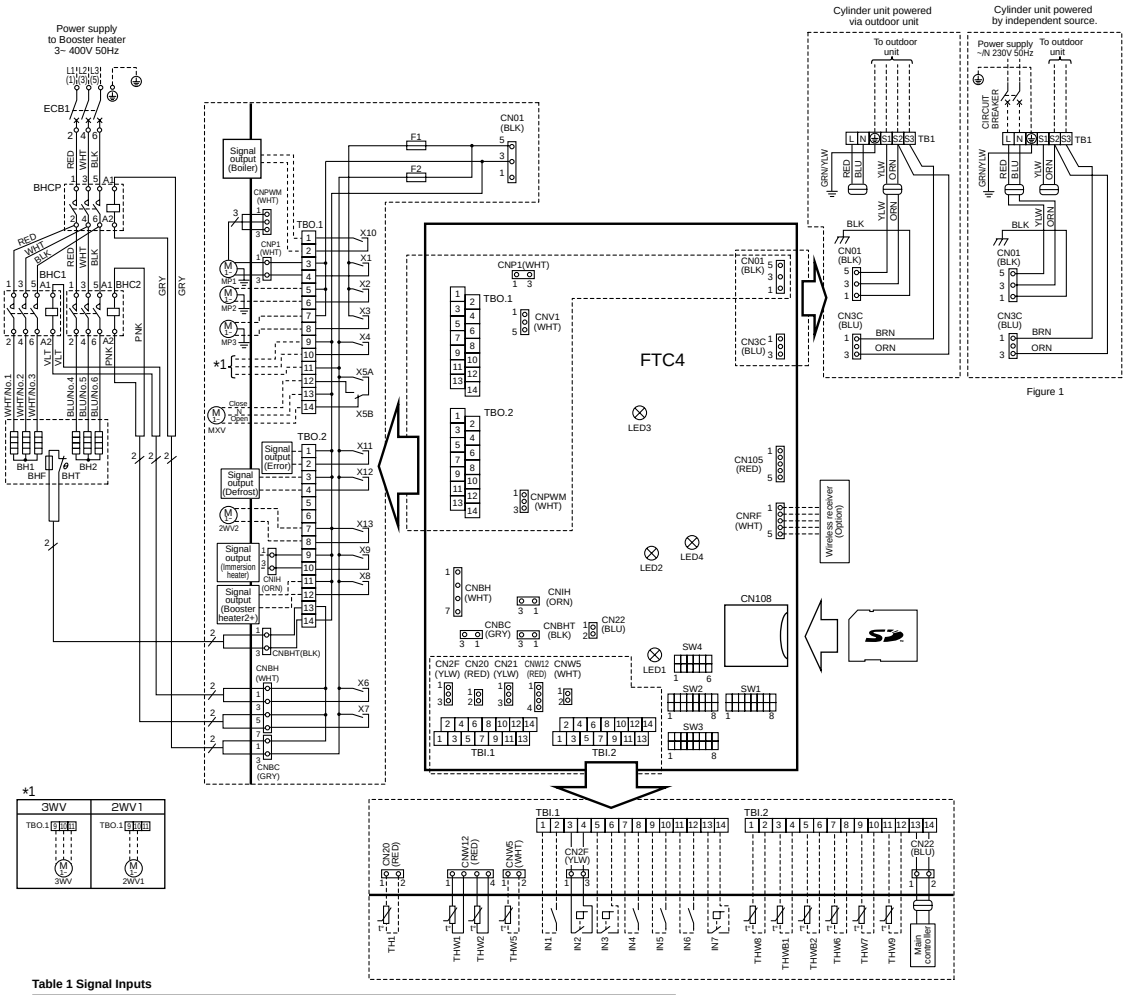


Figure 1

Table 1 Signal Inputs

Name	Terminal block	Connector	Item	OFF (Open)	ON (Short)
IN1	TBI.1 1-2	—	Room thermostat 1 input	Refer to SW2-1 in <6-11 Dip switch setting>	
IN2	TBI.1 3-4	CN2F	Flow switch 1 input	Refer to SW2-2 in <6-11 Dip switch setting>	
IN3	TBI.1 5-6	—	Flow switch 2 input (Zone1)	Refer to SW3-2 in <6-11 Dip switch setting>	
IN4	TBI.1 7-8	—	Demand control input	Normal	Heat source OFF/Boiler operation *2
IN5	TBI.1 9-10	—	Outdoor thermostat input *1	Standard operation	Heater operation/Boiler operation *2
IN6	TBI.1 11-12	—	Room thermostat 2 input	Refer to SW3-1 in <6-11 Dip switch setting>	
IN7	TBI.1 13-14	—	Flow switch 3 input (Zone2)	Refer to SW3-3 in <6-11 Dip switch setting>	

*1. If using outdoor thermostat for controlling operation of heaters, the lifetime of the heaters and related parts may be reduced.
*2. To turn on the boiler operation, use the main controller to select “Boiler” in “External/input setting“ screen in the service menu.

Table 2 Outputs

Name	Terminal block	Connector	Item	OFF	ON
OUT1	TBO.1 3-4	CNP1	Water circulation pump 1 output (Space heating & DHW)	OFF	ON
OUT2	TBO.1 5-6	—	Water circulation pump 2 output (Space heating for Zone1)	OFF	ON
OUT3	TBO.1 7-8	—	Water circulation pump 3 output (Space heating for Zone2)	OFF	ON
OUT4	TBO.1 9-11	CNV1	3-way valve (2-way valve1) output	Heating	DHW
OUT5	TBO.1 12-13	—	Mixing valve output	Stop	Close
	TBO.1 13-14			Stop	Open
OUT6	—	CNBH 1-3	Booster heater 1 output	OFF	ON
OUT7	—	CNBH 5-7	Booster heater 2 output	OFF	ON
OUT8	TBO.2 11-12	—	Booster heater 2+ output	OFF	ON
OUT9	TBO.2 9-10	CNIH	Immersion heater output	OFF	ON
OUT10	TBO.1 1-2	—	Boiler output	OFF	ON
OUT11	TBO.2 1-2	—	Error output	Normal	Error
OUT12	TBO.2 3-4	—	Defrost output	Normal	Defrost
OUT13	TBO.2 7-8	—	2-way valve 2 output	DHW	Heating

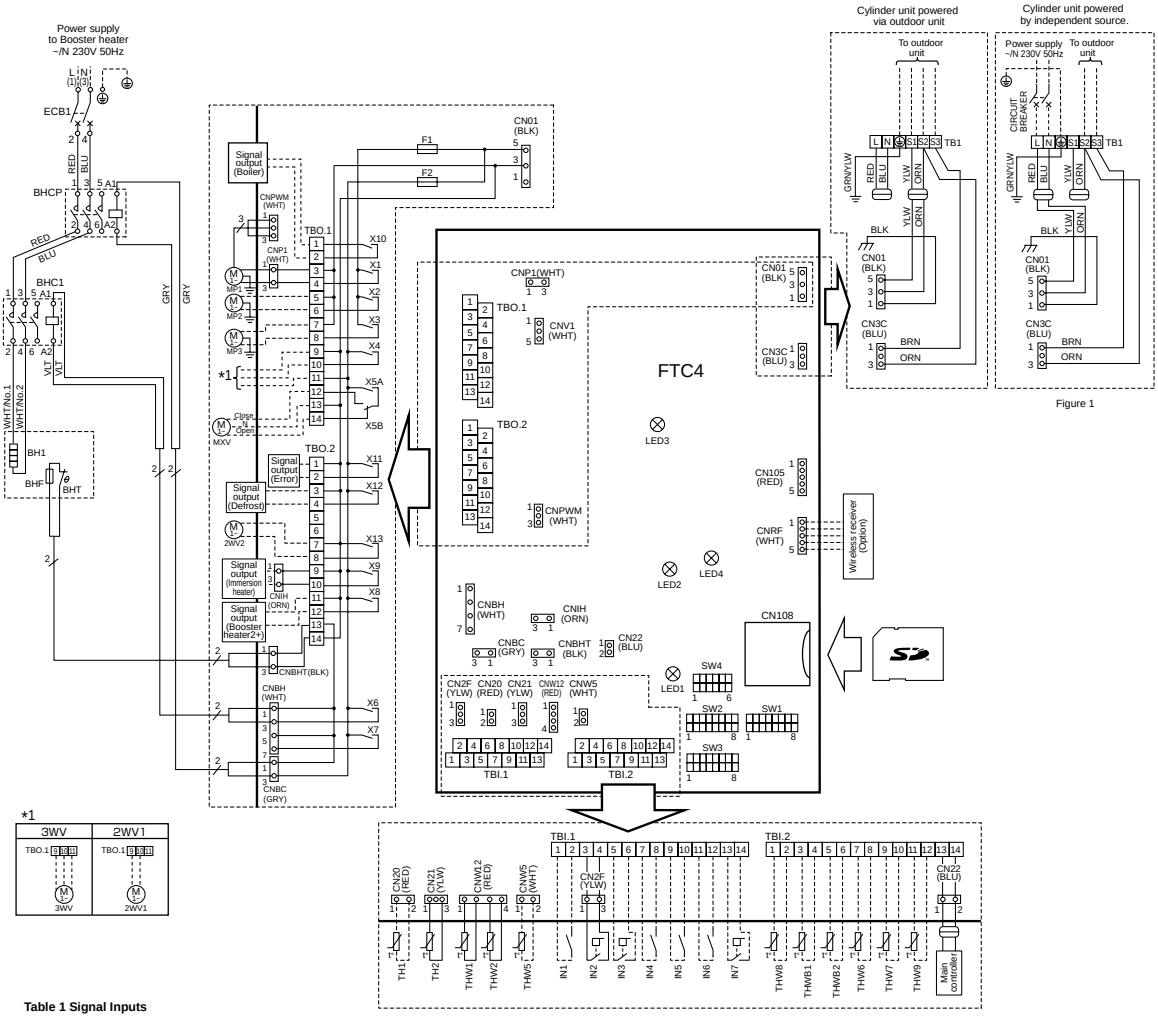
Symbol	Name
TB1	Terminal block <Power supply, Outdoor unit>
ECB1	Earth leakage circuit breaker for booster heater
MP1	Water circulation pump1(Space heating & DHW)
MP2	Water circulation pump2 (Space heating for Zone1)(Field supply)
MP3	Water circulation pump3 (Space heating for Zone2)(Field supply)
3WV(2WV1)	3-way valve (2-way valve1)(Field supply)
2WV2	2-way valve2 (Field supply)
MXV	Mixing valve (Field supply)
BHT	Thermostat for booster heater
BHF	Thermal fuse for booster heater
BH1	Booster heater 1
BH2	Booster heater 2
BHC1	Contactor for booster heater 1
BHC2	Contactor for booster heater 2
BHCP	Contactor for booster heater protection

Symbol	Name
TH1	Thermistor (Room temp.)(Option)
THW1	Thermistor (Flow water temp.)
THW2	Thermistor (Return water temp.)
THW5	Thermistor (DHW tank water temp.)(Option)
THW6	Thermistor (Zone1 flow temp.)(Option)
THW7	Thermistor (Zone1 return temp.)(Option)
THW8	Thermistor (Zone2 flow temp.)(Option)
THW9	Thermistor (Zone2 return temp.)(Option)
THWB1	Thermistor (Boiler flow temp.)(Option)
THWB2	Thermistor (Boiler return temp.)(Option)
IN1	Room thermostat 1 (Field supply)
IN2	Flow switch 1
IN3	Flow switch 2 (Field supply)
IN4	Demand control (Field supply)
IN5	Outdoor thermostat (Field supply)
IN6	Room thermostat 2 (Field supply)
IN7	Flow switch 3 (Field supply)

FLOW TEMP. CONTROLLER (FTC4)	
TBO.1~2	Terminal block <Outputs>
TBI.1~2	Terminal block <Signal Inputs, Thermistor>
F1~F2	Fuse (T6.3AL250V)
SW1~4	Dip switch *See 6-11 Dip switch setting
X1~X12	Relay
LED1	Power supply (FTC4)
LED2	Power supply (Main controller)
LED3	Communication (FTC4-Outdoor unit)
LED4	Reading or writing data to SD card
CNPWM	Pump speed control signal for MP1
CN108	SD card connector

1. Symbols used in wiring diagram are, ⊡⊡ : connector, ⊡⊡⊡ : terminal block.
2. Indoor unit and outdoor unit connecting wires have polarities, make sure to match terminal numbers (S1, S2, S3) for correct wirings,
3. Since the outdoor unit side electric wiring may change, be sure to check the outdoor unit electric wiring diagram for servicing.
4. This diagram shows the wiring of indoor unit and outdoor unit connecting wires (specification of 230V), adopting superimposed system of power and signal. When work to supply power separately to indoor unit and outdoor unit was applied, refer to Figure 1.

6-10. ERSC-VM2B



*1

3WV	2WV1
TBO.1 9 10 11	TBO.1 9 10 11
M C 3WV	M C 2WV1

Table 1 Signal Inputs

Name	Terminal block	Connector	Item	OFF (Open)	ON (Short)
IN1	TBI.1 1-2	—	Room thermostat 1 input	Refer to SW2-1 in <6-11 Dip switch setting>	
IN2	TBI.1 3-4	CN2F	Flow switch 1 input	Refer to SW2-2 in <6-11 Dip switch setting>	
IN3	TBI.1 5-6	—	Flow switch 2 input (Zone1)	Refer to SW3-2 in <6-11 Dip switch setting>	
IN4	TBI.1 7-8	—	Demand control input	Normal	Heat source OFF/Boiler operation *2
IN5	TBI.1 9-10	—	Outdoor thermostat input *1	Standard operation	Heater operation/Boiler operation *2
IN6	TBI.1 11-12	—	Room thermostat 2 input	Refer to SW3-1 in <6-11 Dip switch setting>	
IN7	TBI.1 13-14	—	Flow switch 3 input (Zone2)	Refer to SW3-3 in <6-11 Dip switch setting>	

*1. If using outdoor thermostat for controlling operation of heaters, the lifetime of the heaters and related parts may be reduced.
*2. To turn on the boiler operation, use the main controller to select “Boiler” in “External/input setting“ screen in the service menu.

Table 2 Outputs

Name	Terminal block	Connector	Item	OFF	ON
OUT1	TBO.1 3-4	CNP1	Water circulation pump 1 output (Space heating & DHW)	OFF	ON
OUT2	TBO.1 5-6	—	Water circulation pump 2 output (Space heating for Zone1)	OFF	ON
OUT3	TBO.1 7-8	—	Water circulation pump 3 output (Space heating for Zone2)	OFF	ON
OUT4	TBO.1 9-11	CNV1	3-way valve (2-way valve1) output	Heating	DHW
OUT5	TBO.1 12-13	—	Mixing valve output	Stop	Close
	TBO.1 13-14			Stop	Open
OUT6	—	CNBH 1-3	Booster heater 1 output	OFF	ON
OUT7	—	CNBH 5-7	Booster heater 2 output	OFF	ON
OUT8	TBO.2 11-12	—	Booster heater 2+ output	OFF	ON
OUT9	TBO.2 9-10	CNIH	Immersion heater output	OFF	ON
OUT10	TBO.1 1-2	—	Boiler output	OFF	ON
OUT11	TBO.2 1-2	—	Error output	Normal	Error
OUT12	TBO.2 3-4	—	Defrost output	Normal	Defrost
OUT13	TBO.2 7-8	—	2-way valve 2 output	DHW	Heating

Symbol	Name
TB1	Terminal block <Power supply, Outdoor unit>
ECB1	Earth leakage circuit breaker for booster heater
MP1	Water circulation pump1(Space heating & DHW)
MP2	Water circulation pump2 (Space heating for Zone1)(Field supply)
MP3	Water circulation pump3 (Space heating for Zone2)(Field supply)
3WV(2WV1)	3-way valve (2-way valve1)(Field supply)
2WV2	2-way valve2 (Field supply)
MXV	Mixing valve (Field supply)
BHT	Thermostat for booster heater
BHF	Thermal fuse for booster heater
BH1	Booster heater 1
BHC1	Contactor for booster heater 1
BHCP	Contactor for booster heater protection

Symbol	Name
TH1	Thermistor (Room temp.)(Option)
TH2	Thermistor (Ref. liquid temp.)
THW1	Thermistor (Flow water temp.)
THW2	Thermistor (Return water temp.)
THW5	Thermistor (DHW tank water temp.)(Option)
THW6	Thermistor (Zone1 flow temp.)(Option)
THW7	Thermistor (Zone1 return temp.)(Option)
THW8	Thermistor (Zone2 flow temp.)(Option)
THW9	Thermistor (Zone2 return temp.)(Option)
THWB1	Thermistor (Boiler flow temp.)(Option)
THWB2	Thermistor (Boiler return temp.)(Option)
IN1	Room thermostat 1 (Field supply)
IN2	Flow switch 1
IN3	Flow switch 2 (Field supply)
IN4	Demand control (Field supply)
IN5	Outdoor thermostat (Field supply)
IN6	Room thermostat 2 (Field supply)
IN7	Flow switch 3 (Field supply)

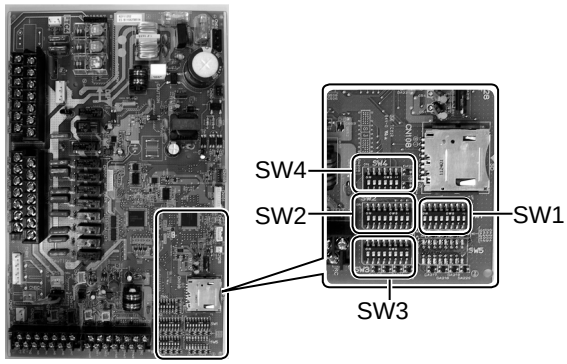
FLOW TEMP. CONTROLLER (FTC4)	
TBO.1~2	Terminal block <Outputs>
TBI.1~2	Terminal block <Signal Inputs, Thermistor>
F1~F2	Fuse (T6.3AL250V)
SW1~4	Dip switch *See 6-11 Dip switch setting
X1~X12	Relay
LED1	Power supply (FTC4)
LED2	Power supply (Main controller)
LED3	Communication (FTC4-Outdoor unit)
LED4	Reading or writing data to SD card
CNPWM	Pump speed control signal for MP1
CN108	SD card connector

1. Symbols used in wiring diagram are, ⊙⊙ : connector, □□□ : terminal block.
2. Indoor unit and outdoor unit connecting wires have polarities, make sure to match terminal numbers (S1, S2, S3) for correct wirings,
3. Since the outdoor unit side electric wiring may change, be sure to check the outdoor unit electric wiring diagram for servicing.
4. This diagram shows the wiring of indoor unit and outdoor unit connecting wires (specification of 230V), adopting superimposed system of power and signal. When work to supply power separately to indoor unit and outdoor unit was applied, refer to Figure 1.

6-11. Dip switch setting

Located on the FTC4 printed circuit board are 4 sets of small white switches known as Dip switches. The Dip switch number is printed on the circuit board next to the relevant switches. The word ON is printed on the circuit board and on the Dip switch block itself. To move the switch you will need to use a pin or the corner of a thin metal ruler or similar.

Dip switch settings are listed in the table below.
Before changing any switch settings, ensure power supplies to indoor and outdoor units are isolated/powered off.



Dip switch		Function	OFF	ON	Default settings: Indoor unit model
SW1	SW1-1	Boiler	WITHOUT Boiler	WITH Boiler	OFF
	SW1-2	Heat pump maximum outlet water temperature	55ºC	60ºC	ON *1
	SW1-3	DHW tank	WITHOUT DHW tank	WITH DHW tank	OFF
	SW1-4	Immersion heater	WITHOUT Immersion heater	WITH Immersion heater	OFF
	SW1-5	Booster heater	WITHOUT Booster heater	WITH Booster heater	ON
	SW1-6	Booster heater function	For heating only	For heating and DHW	ON
	SW1-7	Outdoor unit type	Split type	Packaged type	OFF: E*SC-*M*B ON : EHPX-*M*B
	SW1-8	Wireless remote controller	WITHOUT Wireless remote controller	WITH Wireless remote controller	OFF
SW2	SW2-1	Room thermostat1 input (IN1) logic change	Zone1 operation stop at thermostat short	Zone1 operation stop at thermostat open	OFF
	SW2-2	Flow switch1 input (IN2) logic change	Failure detection at short	Failure detection at open	ON
	SW2-3	Booster heater capacity restriction	Inactive	Active	OFF: Except E***-VM2B ON : E***-VM2B
	SW2-4	Cooling mode function	Inactive	Active	OFF: Except ERSC-VM2B ON : ERSC-VM2B
	SW2-5	Automatic switch to backup heat source operation (When outdoor unit stops by error)	Inactive	Active *2	OFF
	SW2-6	Mixing tank	WITHOUT Mixing tank	WITH Mixing tank	OFF
	SW2-7	2-zone temperature control	Inactive	Active	OFF
	SW2-8	—	—	-	OFF
SW3	SW3-1	Room thermostat 2 input (IN6) logic change	Zone2 operation stop at thermostat short	Zone2 operation stop at thermostat open	OFF
	SW3-2	Flow switch 2 input (IN3) logic change	Failure detection at short	Failure detection at open	OFF
	SW3-3	Flow switch 3 input (IN7) logic change	Failure detection at short	Failure detection at open	OFF
	SW3-4	Cooling operation in Zone2	Not in use	In use	OFF
	SW3-5	Heating mode function *3	Inactive	Active	OFF
	SW3-6	—	—	—	OFF
	SW3-7	—	—	—	OFF
	SW3-8	—	—	—	OFF
SW4	SW4-1	Multiple outdoor units control	Inactive	Active	OFF
	SW4-2	Position of multiple outdoor units control *4	Slave	Master	OFF
	SW4-3	LED3 display	Indoor-outdoor communication	Refrigerant address	OFF
	SW4-4	—	—	—	OFF
	SW4-5	Emergency mode (Heater only operation)	Normal	"Emergency mode (Heater only operation) (To be activated only when powered ON)"	OFF *5
	SW4-6	Emergency mode (Boiler operation)	Normal	"Emergency mode (Boiler operation) (To be activated only when powered ON)"	OFF *5

Note: **✻1. When the hydrobox is connected with a PUHZ-RP outdoor unit of which maximum outlet water temperature is 55ºC, Dip SW1-2 must be changed to OFF.**
✻2. OUT11 will be available. For safety reasons, this function is not available for certain errors. (In that case, system operation must be stopped and only the water circulation pump keeps running.)
✻3 This switch functions only when the hydrobox is connected with a PUHZ-FRP outdoor unit. When another type of outdoor unit is connected, the heating mode function is active regardless of the fact that this switch is ON or OFF.
✻4. SW4-2 is available only when SW4-1 is ON.
✻5. If emergency mode is no longer required, return the switch to OFF position.

Automatic switch to heat source only operation

Back-up heat source operation (*1) will automatically run when the outdoor unit stops abnormally.
To enable the function, switch Dip SW 2-5 to ON.
During the back-up operation, an error code(s) and the contact number will be displayed alternately.
External output (OUT11) will be available.
To clear the fault(s), reset the power breakers on the indoor and outdoor units.

<Applicable error codes (*2)>
E6 to E9, ED, P6, P8, U1 to U8, UD, UE, UF, UL, UP

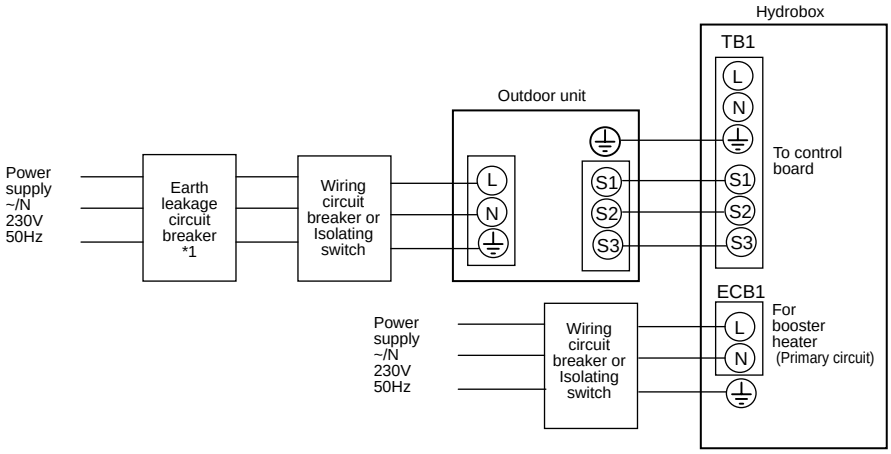
(*1) Prolonged running of the back-up operation may affect the life of the heat source.
(*2) For safety reasons, this function is not available for certain faults. (System operation must be stopped and only pump keeps running.)

7 FIELD WIRING

Breaker abbreviation	Meaning
ECB1	Earth leakage circuit breaker for booster heater
TB1	Terminal block 1

Option 1: Hydrobox powered via outdoor unit

<1 phase>



*1 If the installed earth leakage circuit breaker does not have an over-current protection function, install a breaker with that function along the same power line.

*2 Affix label A which is included with the manuals near each wiring diagram for hydrobox and outdoor units.

<Figure 7-1>
Electrical connections 1 phase

Description	Power supply	Capacity	Breaker	Wiring
Booster heater (Primary circuit)	~/N 230 V 50 Hz	2 kW	16 A *1	2.5 mm²
		6 kW	32 A *1	6.0 mm²

Wiring Wiring No. × size (mm²)	Hydrobox - Outdoor unit	*2	3 × 1.5 (polar)
	Hydrobox - Outdoor unit earth	*2	1 × Min. 1.5
Circuit rating	Hydrobox - Outdoor unit S1 - S2	*3	230V AC
	Hydrobox - Outdoor unit S2 - S3	*3	24V DC

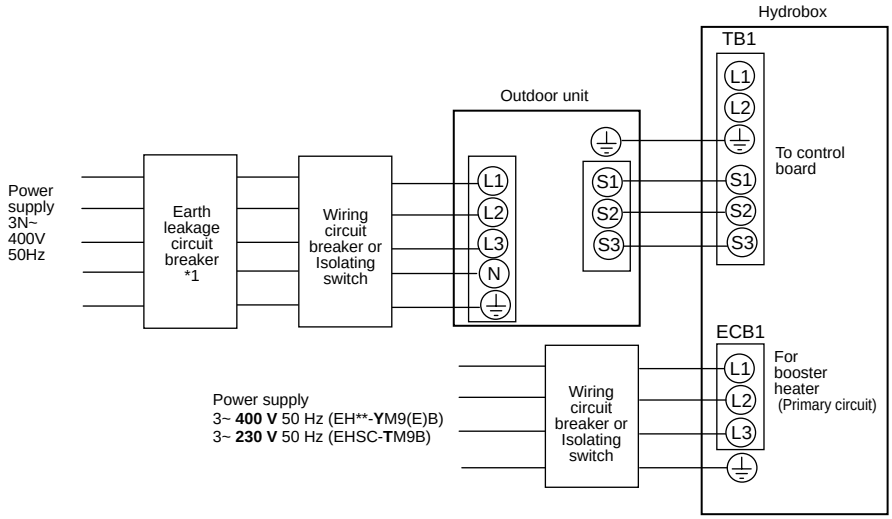
*1. A breaker with at least 3.0 mm contact separation in each pole shall be provided. Use earth leakage breaker (NV). The breaker shall be provided to ensure disconnection of all active phase conductors of the supply.

*2. Max. 45 m
If 2.5 mm² used, Max. 50 m
If 2.5 mm² used and S3 separated, Max. 80 m

*3. The values given in the table above are not always measured against the ground value.

Notes:
1. **Wiring size must comply with the applicable local and national codes.**
2. **Indoor unit/outdoor unit connecting cords shall not be lighter than polychloroprene sheathed flexible cord. (Design 60245 IEC 57)**
   Indoor unit power supply cords shall not be lighter than polychloroprene sheathed flexible cord. (Design 60227 IEC 53)
3. **Install an earth longer than other cables.**
4. **Please keep enough output capacity of power supply for each heater. Insufficient power supply capacity might cause chattering.**

<3 phase>



*1 If the installed earth leakage circuit breaker does not have an over-current protection function, install a breaker with that function along the same power line.

*2 Affix label A which is included with the manuals near each wiring diagram for hydrobox and outdoor units.

<Figure 7-2>
Electrical connections 3 phase

Description	Power supply	Capacity	Breaker	Wiring
Booster heater (Primary circuit)	3~ 400 V 50 Hz	9 kW	16 A *1	2.5 mm²
	3~ 230 V 50 Hz	9 kW	32 A *1	6.0 mm²

Wiring Wiring No. × size (mm²)	Hydrobox - Outdoor unit	*2	3 × 1.5 (polar)
	Hydrobox - Outdoor unit earth	*2	1 × Min. 1.5
Circuit rating	Hydrobox - Outdoor unit S1 - S2	*3	230V AC
	Hydrobox - Outdoor unit S2 - S3	*3	24V DC

*1. A breaker with at least 3.0 mm contact separation in each pole shall be provided. Use earth leakage breaker (NV).
The breaker shall be provided to ensure disconnection of all active phase conductors of the supply.

*2. Max. 45 m
If 2.5 mm² used, Max. 50 m
If 2.5 mm² used and S3 separated, Max. 80 m

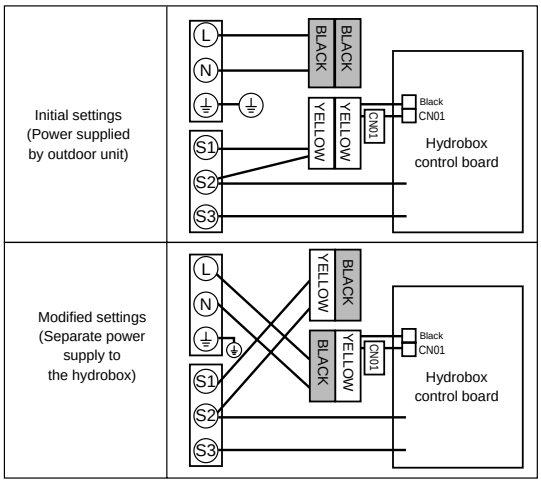
*3. The values given in the table above are not always measured against the ground value.

Notes:
1. Wiring size must comply with the applicable local and national codes.
2. Indoor unit/outdoor unit connecting cords shall not be lighter than polychloroprene sheathed flexible cord. (Design 60245 IEC 57)
Indoor unit power supply cords shall not be lighter than polychloroprene sheathed flexible cord. (Design 60227 IEC 53)
3. Install an earth longer than other cables.
4. Please keep enough output capacity of power supply for each heater. Insufficient power supply capacity might cause chattering.

Option2: Hydrobox powered by independent source

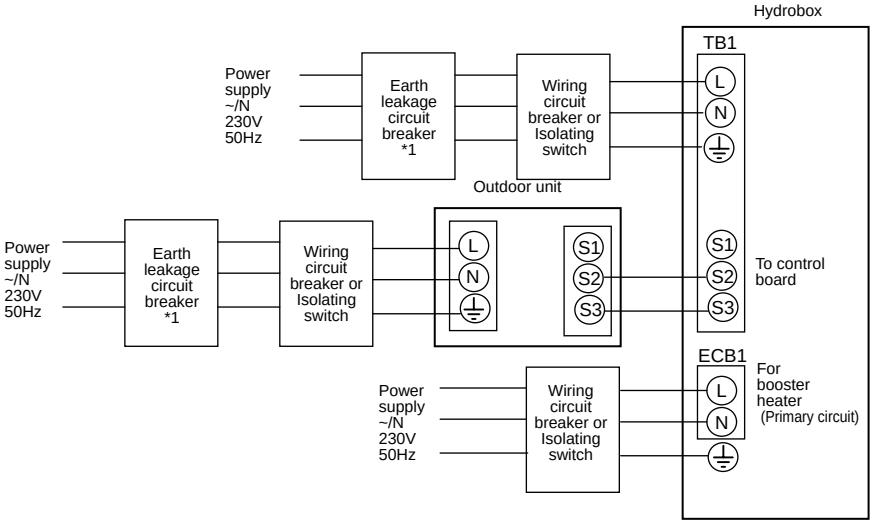
If the hydrobox and outdoor units have separate power supplies, the following requirements MUST be carried out:

- **Change connector connections in hydrobox control and electrical box (see Figure 7-3).**
- **Turn the outdoor unit DIP switch SW8-3 to ON.**
- **Turn on the outdoor unit BEFORE the hydrobox.**



<Figure 7-3>

<1 phase>



*1 If the installed earth leakage circuit breaker does not have an over-current protection function, install a breaker with that function along the same power line.

*2 Affix label B which is included with the manuals near each wiring diagram for hydrobox and outdoor units.

<Figure 7-4>
Electrical connections 1 phase

Description	Power supply	Capacity	Breaker	Wiring
Booster heater (Primary circuit)	~/N 230 V 50 Hz	2 kW	16 A *1	2.5 mm²
		6 kW	32 A *1	6.0 mm²

Hydrobox power supply			~/N 230 V 50 Hz
Hydrobox input capacity Main switch (Breaker)		*1	16 A
Wiring Wiring No. × size (mm²)	Hydrobox power supply		2 × Min. 1.5
	Hydrobox power supply earth		1 × Min. 1.5
	Hydrobox - Outdoor unit	*2	2 × Min. 0.3
	Hydrobox - Outdoor unit earth		—
Circuit rating	Hydrobox L - N	*3	230V AC
	Hydrobox - Outdoor unit S1 - S2	*3	—
	Hydrobox - Outdoor unit S2 - S3	*3	24V DC

*1. A breaker with at least 3.0 mm contact separation in each pole shall be provided. Use earth leakage breaker (NV). The breaker shall be provided to ensure disconnection of all active phase conductors of the supply.

*2. Max. 120 m

*3. The values given in the table above are not always measured against the ground value.

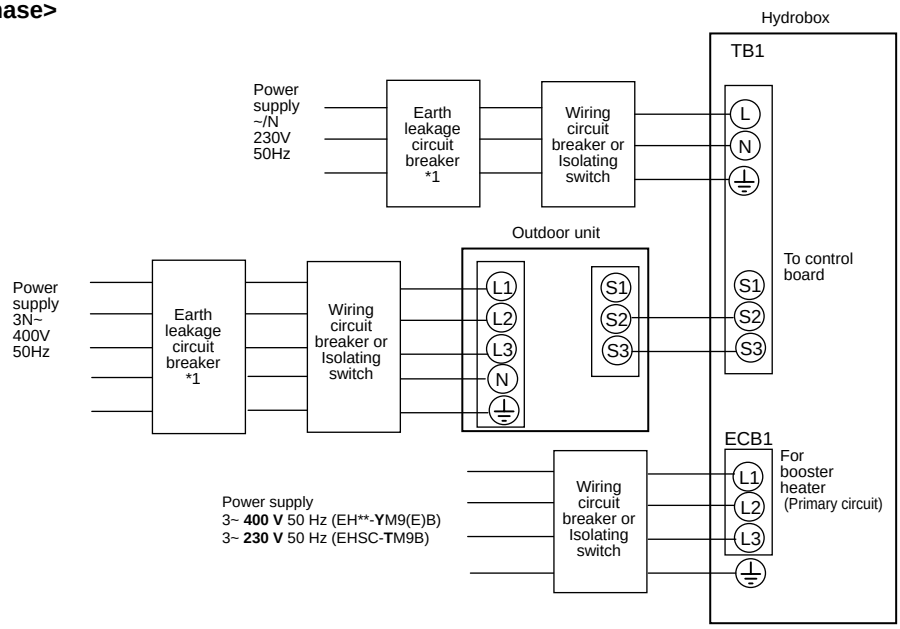
Notes: 1. Wiring size must comply with the applicable local and national codes.

2. Indoor unit/outdoor unit connecting cords shall not be lighter than polychloroprene sheathed flexible cord. (Design 60245 IEC 57)
Indoor unit power supply cords shall not be lighter than polychloroprene sheathed flexible cord. (Design 60227 IEC 53)

3. Install an earth longer than other cables.

4. Please keep enough output capacity of power supply for each heater. Insufficient power supply capacity might cause chattering.

<3 phase>



*1 If the installed earth leakage circuit breaker does not have an over-current protection function, install a breaker with that function along the same power line.
*2 Affix label B which is included with the manuals near each wiring diagram for hydrobox and outdoor units.

<Figure 7-5>
Electrical connections 3 phase

Description	Power supply	Capacity	Breaker	Wiring
Booster heater (Primary circuit)	3~ 400 V 50 Hz	9 kW	16 A *1	2.5 mm²
	3~ 230 V 50 Hz	9 kW	32 A *1	6.0 mm²

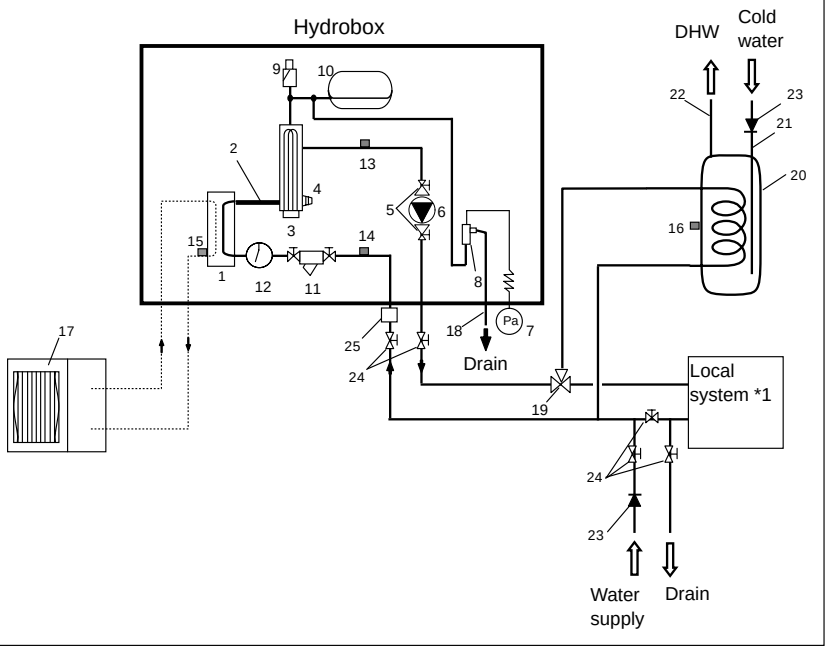
Hydrobox power supply			~/N 230 V 50 Hz
Hydrobox input capacity Main switch (Breaker)		*1	16 A
Wiring Wiring No. × size (mm²)	Hydrobox power supply		2 × Min. 1.5
	Hydrobox power supply earth		1 × Min. 1.5
	Hydrobox - Outdoor unit	*2	2 × Min. 0.3
	Hydrobox - Outdoor unit earth		—
Circuit rating	Hydrobox L - N	*3	230V AC
	Hydrobox - Outdoor unit S1 - S2	*3	—
	Hydrobox - Outdoor unit S2 - S3	*3	24V DC

*1. A breaker with at least 3.0 mm contact separation in each pole shall be provided. Use earth leakage breaker (NV). The breaker shall be provided to ensure disconnection of all active phase conductors of the supply.
*2. Max. 120 m
*3. The values given in the table above are not always measured against the ground value.

Notes:
1. Wiring size must comply with the applicable local and national codes.
2. Indoor unit/outdoor unit connecting cords shall not be lighter than polychloroprene sheathed flexible cord. (Design 60245 IEC 57)
Indoor unit power supply cords shall not be lighter than polychloroprene sheathed flexible cord. (Design 60227 IEC 53)
3. Install an earth longer than other cables.
4. Please keep enough output capacity of power supply for each heater. Insufficient power supply capacity might cause chattering.

8 WATER SYSTEM DIAGRAM

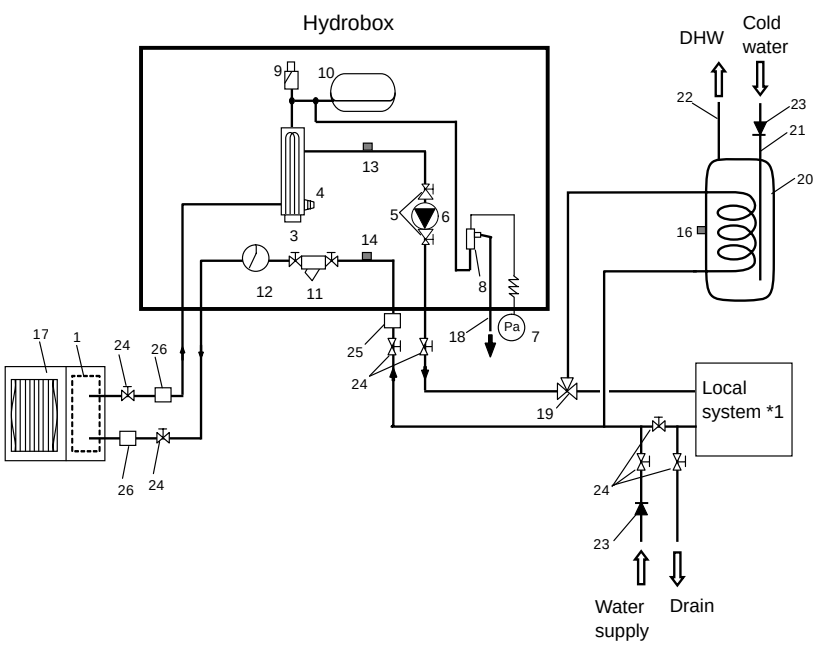
<EHSC> (Split model system)
<ERSC> (Split model system for heating and cooling)



A. Refrigerant pipe
B. Water pipe
1. Plate heat exchanger
2. Flexible hose
3. Booster heater 1,2
4. Drain cock (booster heater)
5. Pump valve
6. Water circulation pump 1
7. Manometer
8. Pressure relief valve
9. Automatic air vent
10. Expansion vessel (except EHSC-*M*EB)
11. Strainer valve
12. Flow switch
13. THW1
14. THW2
15. TH2
16. THW5 (optional part PAC-TH011TK-E)
17. Outdoor unit
18. Drain pipe (field supply)
19. 3-way valve (field supply)
20. DHW indirect unvented tank (field supply)
21. Cold water inlet pipe (field supply)
22. DHW outlet connection (field supply)
23. Back flow prevention device (field supply)
24. Isolating valve (field supply)
25. Magnetic filter is recommended (field supply).
26. Strainer (field supply)

*1 Refer to page 29.

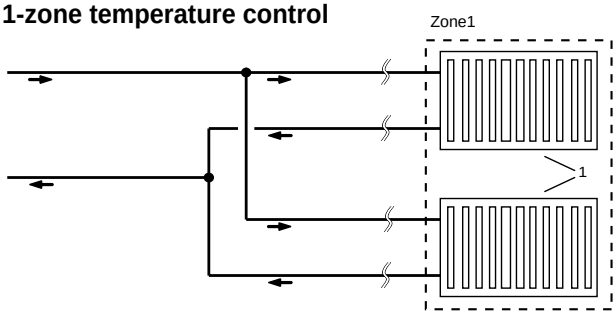
<EHPX> (Packaged model system)

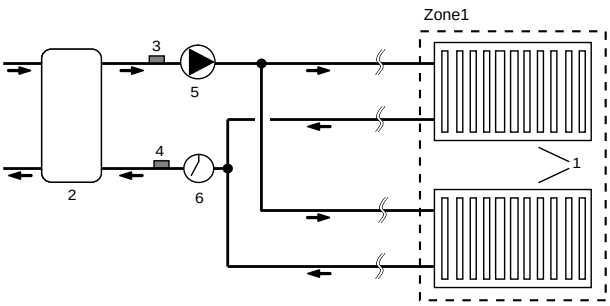


Note
- Be sure to follow your local regulations to perform system configuration of the DHW connections.
- DHW connections are not included in the hydrobox package. All required parts are to be sourced locally.
- To enable draining of the hydrobox an isolating valve should be positioned on both the inlet and outlet pipework.
- Be sure to install a strainer, on the inlet pipe work to the hydrobox.
- Suitable drain pipework should be attached to all relief valves in accordance with your country's regulations.
- A backflow prevention device must be installed on water supply pipework (IEC 61770).
- When using components made from different metals or connecting pipes made of different metals insulate the joints to prevent a corrosive reaction taking place which will damage the pipework.

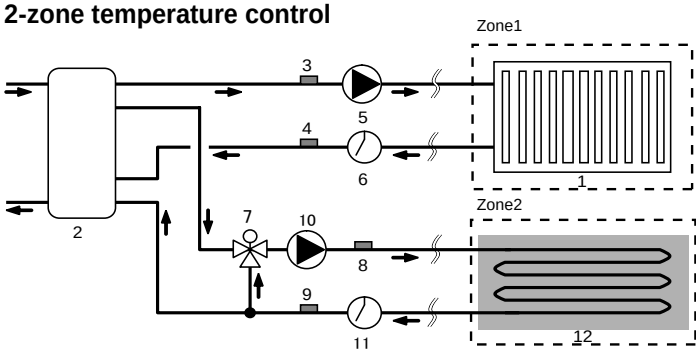
Local system

1-zone temperature control

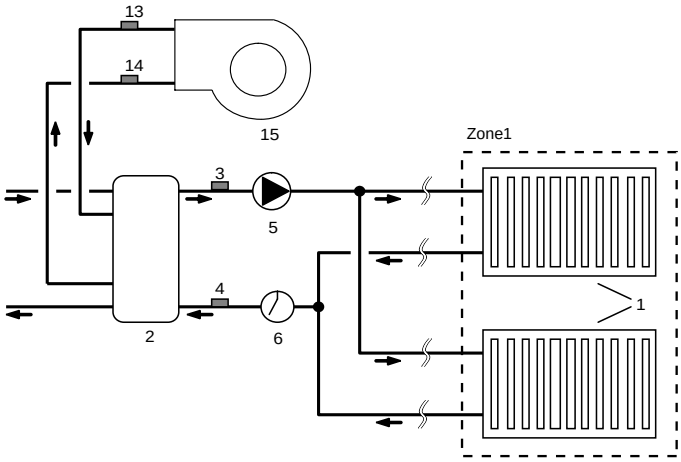




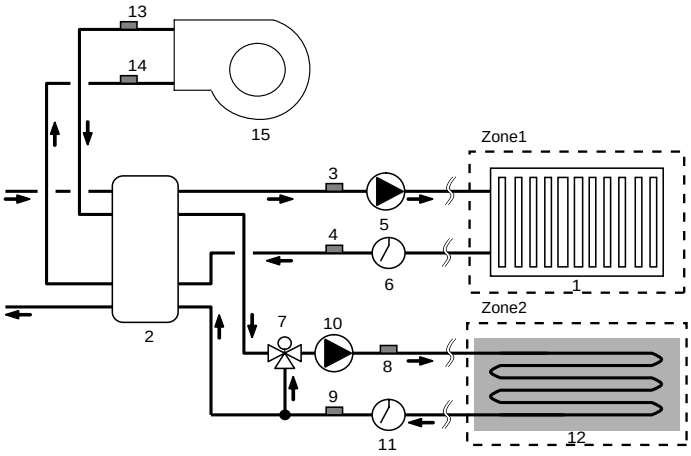
2-zone temperature control



1-zone temperature control with boiler



2-zone temperature control with boiler



1. Zone1 heat emitters (e.g. radiator, fan coil unit) (field supply)
2. Mixing tank (field supply)
3. Zone1 flow water temp. thermistor (THW6)
4. Zone1 return water temp. thermistor (THW7) } Optional part : PAC-TH011-E
5. Zone1 water circulation pump (field supply)
6. Zone1 flow switch (field supply) *
7. Motorized mixing valve (field supply)
8. Zone2 flow water temp. thermistor (THW8)
9. Zone2 return water temp. thermistor (THW9) } Optional part : PAC-TH011-E
10. Zone2 water circulation pump (field supply)
11. Zone2 flow switch (field supply) *
12. Zone2 heat emitters (e.g. underfloor heating) (field supply)
13. Boiler flow water temp. thermistor (THWB1)
14. Boiler return water temp. thermistor (THWB2) } Optional part : PAC-TH011HT-E
15. Boiler

*** Flow switch specifications: DC13 V / 0.1 mA / Both normally-open and normally-closed types can be used. (Set Dip switch 3 to select the logics. Refer to " 6-11. Dip switch setting".)**

Note

- **Two different flow temperatures are NOT available in Cooing mode. The flow temperature for Zone2 during Cooling mode is controlled to be the same temperature as that for Zone1.**
- **The water circuit for Zone2 can be closed during Cooling mode using dip switch 3-4.**

Filling the System (Primary Circuit)

1. Check all connections including factory fitted ones are tight.
2. Insulate pipe work between hydrobox and outdoor unit.
3. Thoroughly clean and flush, system of all debris. (Refer to 4.2 in the installation manual.)
4. Fill primary heating circuit with water and suitable anti-freeze and inhibitor as necessary. **Always use a filling loop with double check valve when filling the primary circuit to avoid back flow contamination of water supply.**

- Anti-freeze should always be used for package systems. It is the responsibility of the installer to decide if anti-freeze solution should be used in split systems depending on each site's conditions. Corrosion inhibitor should be used in both split and package systems.
- When connecting metal pipes of different materials insulate the joints to prevent a corrosive reaction taking place which will damage the pipework.

5. Check for leaks. If leaks are found, retighten the screws on the connections.
6. Pressurise system to 1 bar.
7. Release all trapped air using air vents during and following heating period.
8. Top up with water as necessary. (If pressure falls below 1 bar)

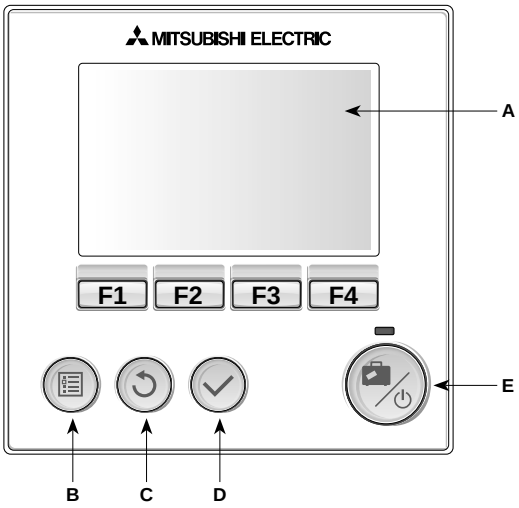
Draining the Hydrobox

WARNING: DRAINED WATER MAY BE VERY HOT

1. Before attempting to drain the hydrobox islolate from the electrical supply to prevent booster heater burning out.
2. Isolate hydrobox from primary water circuit and drain water from hydrobox. Use a suitable heat resistant hose to assist in these operations.
3. Drain any remaining water from booster heater using fitted drain cock and hose, and the drain valve on the primary circuit to safely drain the unit.
4. After the hydrobox is drained, water remains in the following component parts. Drain water completely by checking the inside of the parts.
   - Strainer (Remove the strainer cover.)
   - Pressure relief valve (Operate the valve.)

9 CONTROLS

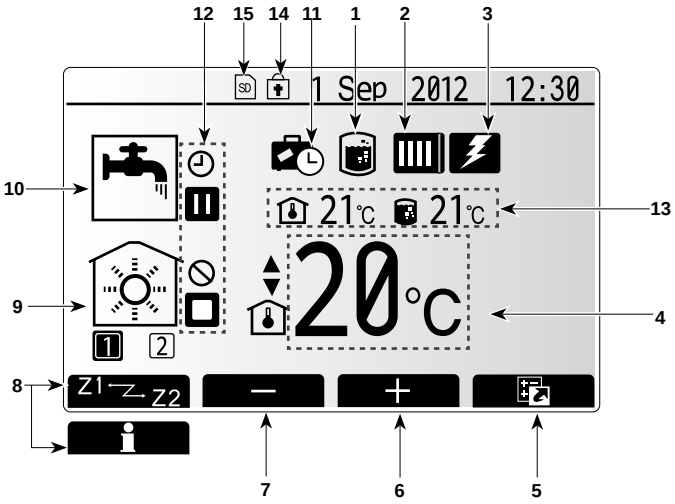
9-1. Main Controller



<Main controller parts>

Letter	Name	Function
A	Screen	Screen in which all information is displayed
B	Menu	Access to system settings for initial set up and modifications.
C	Back	Return to previous menu.
D	Confirm	Used to select or save. (Enter key)
E	Power/Holiday	If system is switched off pressing once will turn system on. Pressing again when system is switched on will enable Holiday Mode. Holding the button down for 3 secs will turn the system off. (***1**)
F1-4	Function keys	Used to scroll through menu and adjust settings. Function is determined by the menu screen visible on screen A.

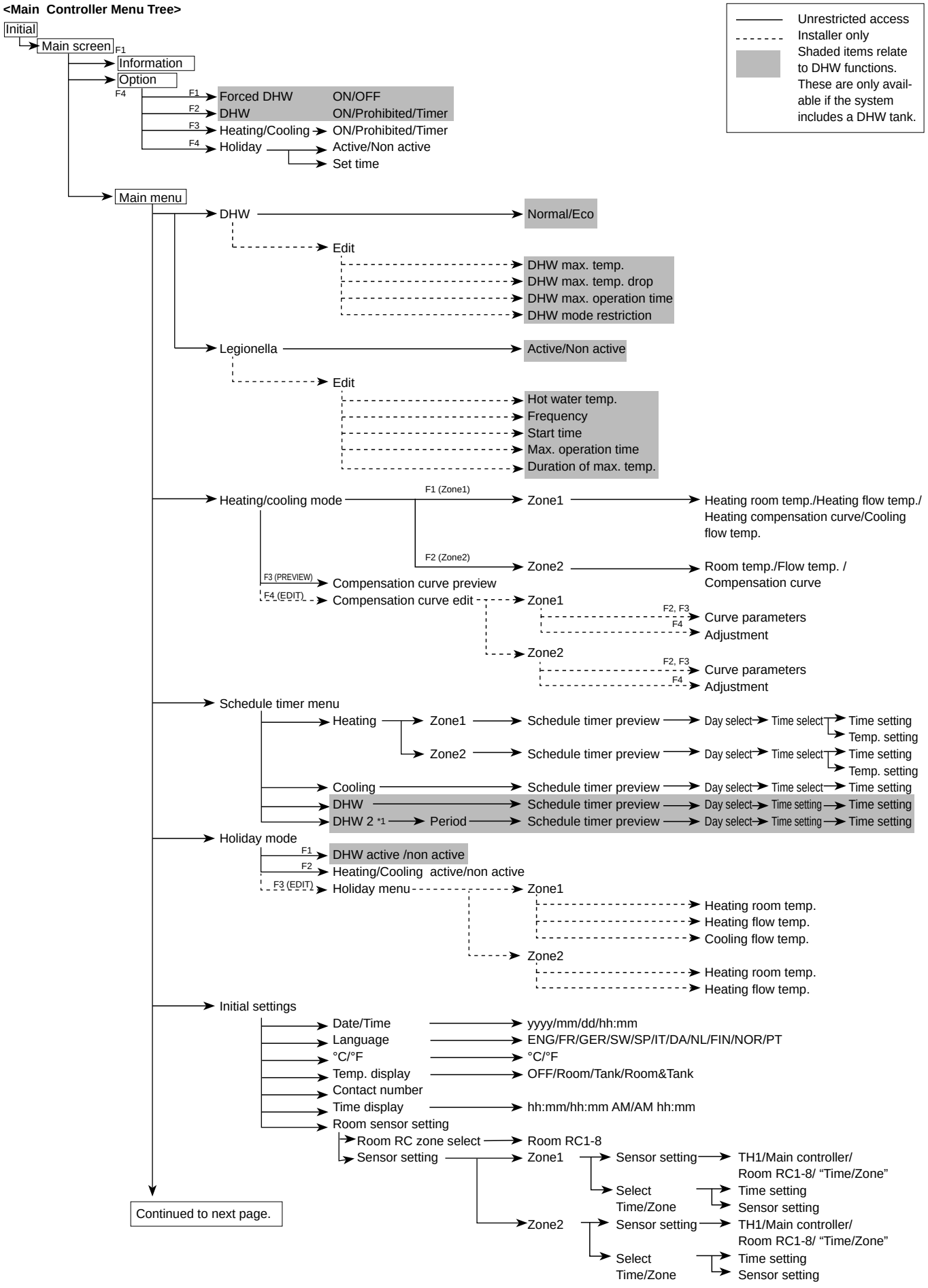
***1**
When the system is switched off or the power supply is disconnected, the hydrobox protection functions (e.g. freeze stat. function) will NOT operate. Please beware that without these safety functions enabled the hydrobox may potentially become exposed to damage.



<Main screen icons>

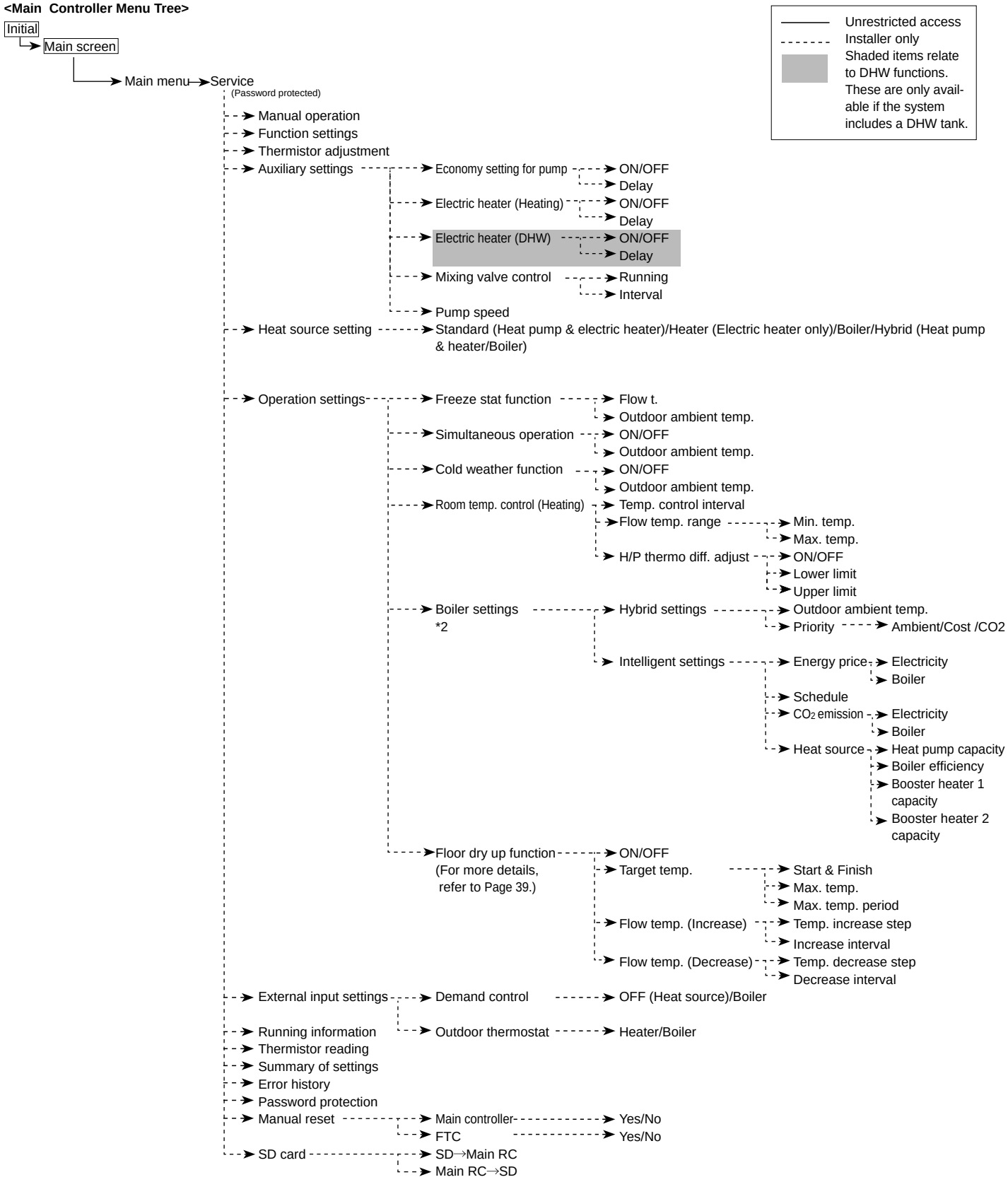
	Icon	Description	
1	Legionella prevention	When this icon is displayed 'Legionella prevention mode' is active.	
2	Heat pump		'Heat pump' is running
			Defrosting
			Emergency heating
3	Electric heater	When this icon is displayed the 'Electric heaters' (booster or immersion heater) are in use.	
4	Target temperature		Target flow temperature
			Target room temperature
			Compensation curve
5	OPTION	Pressing the function button below this icon will display the quick view menu.	
6	+	Increase desired temperature.	
7	-	Decrease desired temperature.	
8	Z1 Z2	Pressing the function button below this icon switches between Zone1 and Zone2.	
	Information	Pressing the function button below this icon displays the information screen.	
9	Space heating (cooling) mode		Heating mode Zone1 or Zone2
			Cooling mode
10	DHW mode	Normal or ECO mode	
11	Holiday mode	When this icon is displayed 'Holiday mode' activated.	
12		Timer	
		Prohibited	
		Stand-by	
		Stop	
		Operating	
13	Current temperature		Current room temperature
			Current water temperature of DHW tank
14		The Menu button is locked or the switching of the operation modes between DHW and Heating operations are disabled in the Option screen.	
15		SD memory card is inserted. Normal operation.	
		SD memory card is inserted. Abnormal operation.	

<Main Controller Menu Tree>



*1 When a PUHZ-FRP outdoor unit is connected.

<Main Controller Menu Tree>



*2 For more details, refer to the installation manual of PAC-TH011HT-E.

Continued from the previous page.

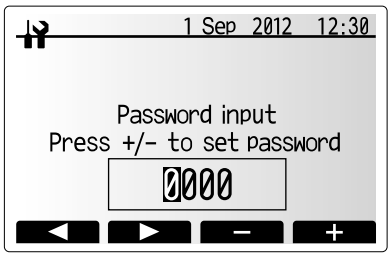
9-2. Service Menu

The service menu provides functions for use by installer or service engineer. It is NOT intended the home owner alters settings within this menu. It is for this reason password protection is required to prevent unauthorised access to the service settings.

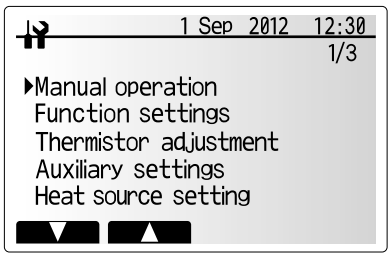
1. From the main setting menu use F2 and F3 to highlight the service icon then press CONFIRM.
2. You will be prompted to enter a password. **THE FACTORY DEFAULT PASSWORD IS "0000".**
3. Press CONFIRM.
   (It takes approx. 30 secs to load the service menu.)

The service menu is navigated using the F1 and F2 buttons to scroll through the functions. The menu is split across three screens and is comprised of the following functions;

1. Manual operation
2. Function settings
3. Thermistor adjustment
4. Auxiliary settings
5. Heat source setting
6. Operation settings
7. External input settings
8. Running information
9. Thermistor reading
10. Summary of settings
11. Error history
12. Password protection
13. Manual reset
14. SD card

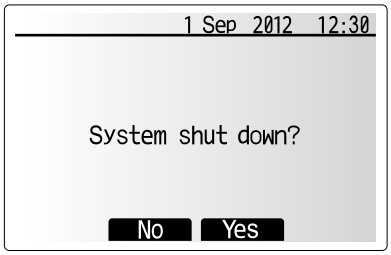


Screen 1 of service menu



Screen 2 of service menu

Note: Many functions can not be set whilst the indoor unit is running. The installer should turn OFF the unit before trying to set these functions. If the installer attempts to change the settings whilst the unit is running the main controller will display a reminder message prompting the installer to stop operation before continuing. By selecting "Yes" the unit will cease operation.



System off prompt screen

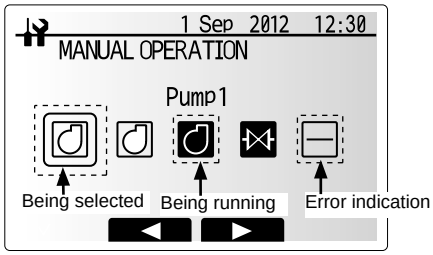
Manual operation

During the filling of the system the water circulation pump and 3-way valve (2-way valve 1), and mixing valve can be manually overridden using manual operation mode.
When manual operation is selected a small timer icon appears in the screen. The function selected will only remain in manual operation for a maximum of 2 hours. This is to prevent accidental permanent override of the FTC4.

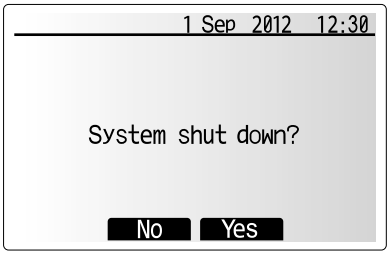
1. From the service menu use F1 and F2 buttons to scroll through list until Manual Operation is highlighted.
2. Press CONFIRM.
3. Manual operation menu screen is displayed.
4. To activate manual operation press the function button under the desired part.

►Example
Pressing F3 button will switch manual operation mode ON for the main 3-way valve. When filling of the DHW tank is complete the installer should access this menu again and press F3 to deactivate manual operation of the part. Alternatively after 2 hours manual operation mode will no longer be active and FTC4 will resume control of the part.

NOTE: Manual operation and heat source setting can not be selected if the system is running. A screen will be displayed asking the installer to stop the system before these modes can be activated.
The system automatically stops 2 hours after last operation.
The OUT13 output of the 2-way valve 2 constitutes an inversion of the OUT4 output of the 2-way valve 1.



Manual operation menu screen



System off prompt screen

Function settings

Function Setting allows the setting of auto recovery after power failure only.

1. From the service menu use F1 and F2 to highlight Function Setting.
2. Press CONFIRM.
3. Ensure the Ref address and unit number are displayed to the right.
4. Press CONFIRM.
5. Use F3 and F4 to highlight either 1/2/3 (see below).

Note: Changes can ONLY be made to Mode 1.

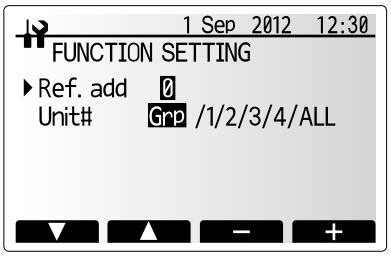
6. Press CONFIRM.

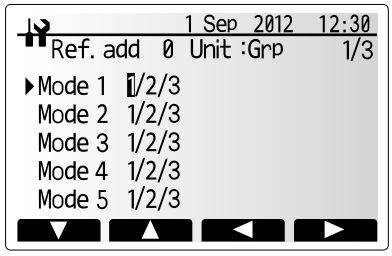
Mode 1 Setting number meanings

1 - Power failure automatic recovery NOT available

2 - Power failure automatic recovery AVAILABLE
(Approx 4-minute delay after power is restored.)

3 - NO FUNCTION

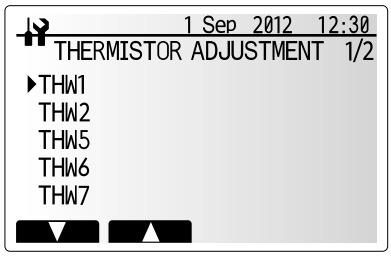


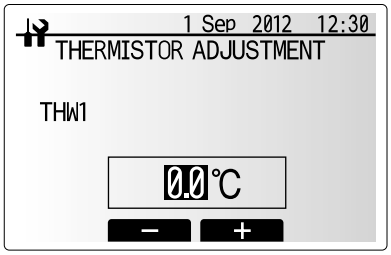


Thermistor adjustment

This function allows adjustments to be made to the thermistor readings from -10 – 10 °C in 0.5 °C intervals.

1. From the Service menu highlight Thermistor Adjustment
2. Press CONFIRM.
3. Use F1 and F2 to select thermistor.
4. Press CONFIRM.
5. Use F2 and F3 to change the thermistor temperature.
6. Press CONFIRM.

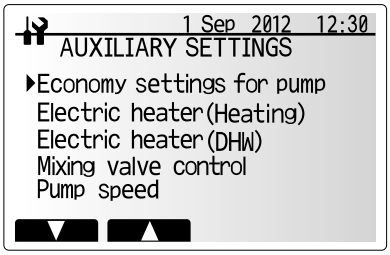




Auxiliary settings

This function is used to set the parameters for any auxiliary parts used in the system.

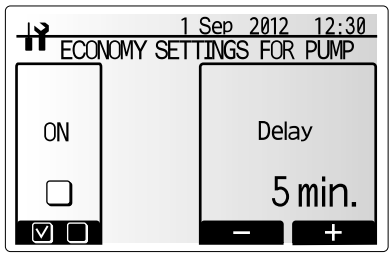
From the service menu use F1 and F2 buttons to highlight Auxiliary settings then press CONFIRM.



Auxiliary settings menu screen

<Economy settings for pump>

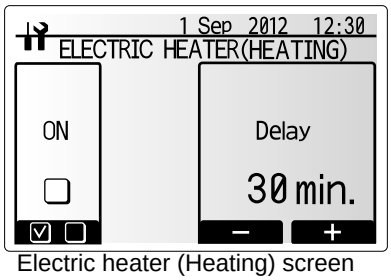
1. From the Auxiliary settings menu highlight Economy Settings for water circulation pump.
2. Press CONFIRM.
3. The economy settings for water circulation pump screen is displayed.
4. Use button F1 to switch the economy settings ON/OFF.
5. Use buttons F3 and F4 to adjust the time the water circulation pump will run. (3 - 60 mins)



Economy settings for pump screen

<Electric heater (Heating)>

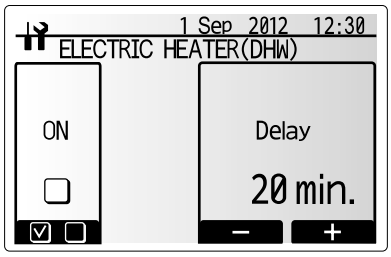
1. From the Auxiliary settings menu highlight Electric heater (Heating).
2. Press CONFIRM.
3. The Electric heater (Heating) screen is displayed.
4. Press F1 button to switch the function ON/OFF.
5. Use F3 and F4 buttons to adjust the time period of heat pump only operation before the booster heater will assist in space heating. (5 -180mins)



Electric heater (Heating) screen

<Electric heater (DHW)>

1. From the Auxiliary settings menu highlight Electric heater (DHW).
2. Press CONFIRM.
3. The Electric heater (DHW) screen is displayed.
4. Press F1 button to switch the function ON/OFF.
5. Use F3 and F4 buttons to adjust the time period of heat pump only operation before the booster heater and the immersion heater (if present) will assist in DHW heating. (15 -30mins)



Electric heater (DHW) screen

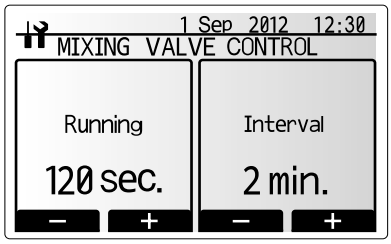
<Mixing valve control>

1. From the Auxiliary settings menu highlight Mixing valve control.
2. Press CONFIRM.
3. The Mixing valve control screen is displayed.
4. Use F1 and F2 buttons to set Running time between 10 to 240 seconds. The Running time equals to a period from full open of the valve (at a hot water mixing ratio of 100%) to full close (at a cold water mixing ratio of 100%).

Note: Set the Running time according to the specifications of the actuator of each mixing valve.

1. From the Auxiliary settings menu highlight Mixing valve control.
2. Press CONFIRM.
3. The Mixing valve control screen is displayed.
4. Press F3 and F4 buttons to set the interval between 2-zone temperature controls of the mixing valve between 1 to 30 mins.

Note: It is recommended to set the interval to 2 minutes that is a default value. With the interval set longer, it could take longer to warm up a room.

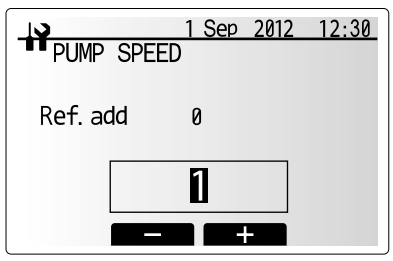


Mixing valve setting screen

<Pump speed>

1. From the Auxiliary settings menu highlight water circulation pump speed.
2. Press CONFIRM.
3. Press F3 and F4 buttons to select a refrigerant address of which you wish to configure or check the settings, and press CONFIRM. *1
4. The Pump speed screen is displayed.
5. Use F2 and F3 buttons to set the pump speed of the water circulation pump between 1 and 5.

*1 For multiple outdoor units control system only.

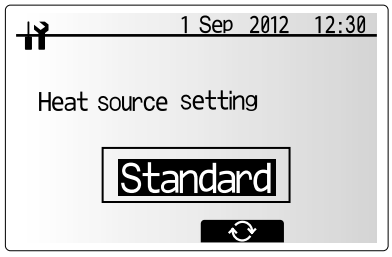


Pump speed setting screen

Heat source setting

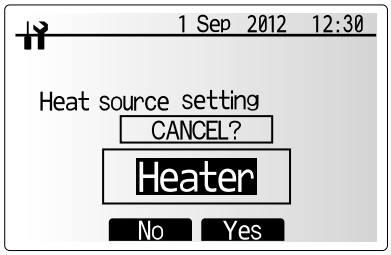
The default heat source setting is heat pump and all electric heaters present in the system to be operational. This is referred to as Standard operation on the menu.

1. From the service menu use F1 and F2 buttons to scroll through list until Heat Source Setting is highlighted.
2. Press CONFIRM.
3. Heat source setting menu screen is displayed.
4. Press F3 button until preferred heat source is displayed.
5. Press CONFIRM.



Heat source setting screen

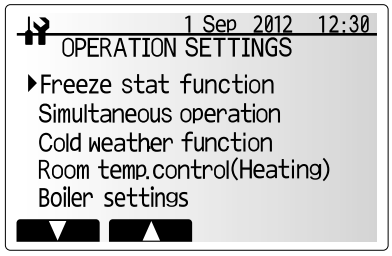
6. If you wish to return to the service menu without saving the setting press return button. You will be asked if you are sure you wish to cancel the changes. Choose Yes or No as appropriate.



Cancel last action screen

Operation settings

1. To access the Operation settings menu use F1 and F2 buttons to scroll through the service menu until Operation settings is highlighted.
2. Press CONFIRM.
3. Operation settings menu is displayed.

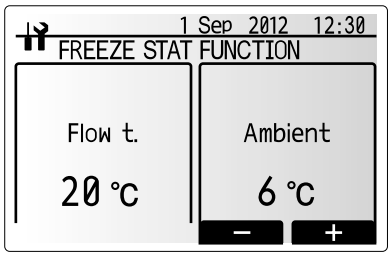


Operation settings menu screen

<Freeze stat function>

1. From the Auxiliary settings menu highlight Freeze Stat Function.
2. Press CONFIRM.
3. The freeze stat function screen will be displayed.
4. Use buttons F3 and F4 to adjust the minimum outdoor ambient temperature at which freeze stat function will begin to operate, (3 - 20 °C) or choose ✻.
   If asterisk (✻) is chosen freeze stat function is deactivated. (i.e. primary water freeze risk)

Note: When the system is turned off, freeze stat function is not enabled.



Freeze stat function screen

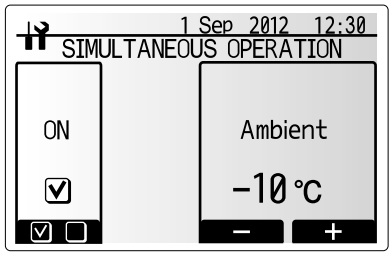
<Simultaneous Operation>

For periods of very low outside temperature this mode can be used. Simultaneous operation allows both DHW and space heating to run together by using the heat pump and/or booster heater to provide space heating whilst only the immersion heater provides heating for DHW. This operation is only available if BOTH a DHW tank AND immersion heater are present on the system.

1. From the Operation settings menu use F1 and F2 buttons to scroll through the list until Simultaneous operation is highlighted.
2. Press CONFIRM.
3. Simultaneous operation screen is displayed.
4. To switch simultaneous operation ON/OFF press F1.
5. To alter the temperature at which simultaneous operation starts use F3 and F4.

Note:

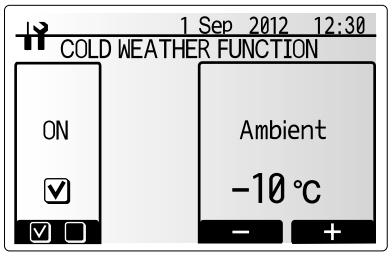
- **Range of outdoor ambient temperature is −15°C to 10°C (default −15°C).**
- **System shall automatically return to routine operation. This will happen when the outdoor ambient temp rises above the selected temp for this specific mode of operation.**



Simultaneous operation screen

<Cold weather function>
For extremely low outdoor ambient temperature conditions when the heat pump's capacity is restricted the heating or DHW is provided only by the electric booster heater (and immersion if present). This function is intended for use during extreme cold periods only. Extensive use of direct electrical heaters ONLY will result in higher electric usage and may reduce working life of heaters and related parts.

1. From the Operation settings menu use F1 and F2 buttons to scroll through the list until Cold weather function is highlighted.
2. Press CONFIRM.
3. Cold weather function screen is displayed.
4. To switch Cold weather function ON/OFF press F1.
5. To alter the temperature at which heater switching function starts use F3 and F4.

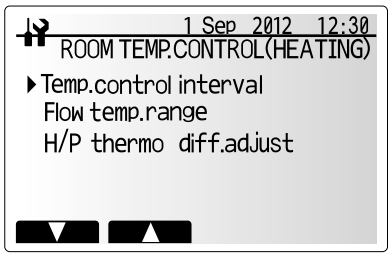


Cold weather function screen

Note:
- **Range of outdoor ambient temperature is −15°C to −10°C (default −15°C).**
- **System shall automatically return to routine operation. This will happen when the outdoor ambient temp rises above the selected temp for this specific mode of operation.**

<Room Temp Control (Heating)>
This function allows operational setting of flow temperature range from the Ecodan and also the time interval at which the FTC4 collects and processes data for the auto adaptation mode.

1. From the Operation settings menu use F1 and F2 buttons to scroll through the list until Room temp. control (Heating) is highlighted.
2. Press CONFIRM.
3. Use F1 and F2 keys to scroll through the menu selecting each subtitle in turn by pressing CONFIRM. See the table below for description of each setting.
4. Enter the desired number using the function keys and press CONFIRM.



Room temp. control (Heating) screen

Menu subtitle		Function	Range	Unit	Default
Temp. control interval		Selectable according to the heat emitter type and the materials of floor (i.e. radiators, floor heating-thick, -thin concrete, wood, etc.)	10 - 60	mins.	10
Flow temperature range	Minimum temp.	To minimize the loss by frequent ON and OFF in mild outdoor ambient temp. seasons.	25 - 45	ºC	30
	Maximum temp.	To set max. possible flow temp according to the type of heat emitters.	35 - 60	ºC	50
Heat pump thermo diff.adjust	On/Off	To minimize the loss by frequent ON and OFF in mild outdoor ambient temp. seasons.	On/Off	—	On
	Lower limit	Prohibits heat pump operation until the flow temperature drops below the target flow temperature minus lower limit value.	−9 - −1	ºC	−5
	Upper limit	Allows heat pump operation until the flow temperature rises above the target flow temperature plus upper limit value.	+3 - +5	ºC	+5

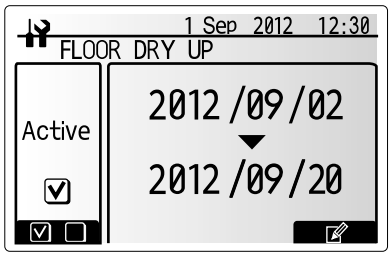
*1 The minimum flow temperature that prohibits heat pump operation is 20ºC.
*2 The maximum flow temperature that allows heat pump operation equals to the maximum temperature set in the flow temp. range menu.

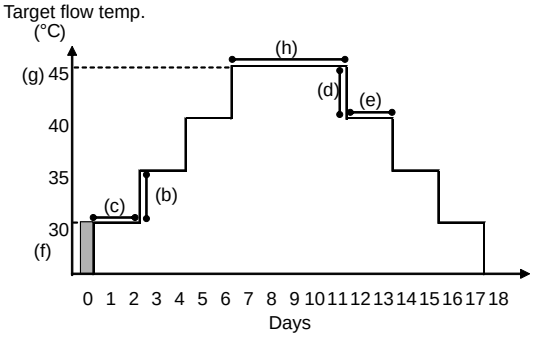
<Floor dry up function>
The Floor dry up function automatically changes the target hot water temperature in stages to gradually dry concrete when this particular type of underfloor heating system is installed.

1. Turn off the system using the main controller.
2. From the Operation settings in the service menu, use F1 and F2 buttons to scroll through the list until Floor dry up function is highlighted.
3. Press CONFIRM to display the FLOOR DRY UP screen.
4. To change settings, press F4. For details on settings, refer to the table below.
5. To start the Floor dry up operation, press F1 button to check a box below "Active" and press CONFIRM.

*1. Upon completion of the operation the system stops all the operations except the Freeze stat. operation.
*2. For Floor dry up function, the target flow temp. of Zone1 is the same as that of Zone2.

Note:
- **This function is not available when a PUHZ-FRP outdoor unit is connected.**
- **Disconnect wiring to external inputs of room thermostat, demand control, and outdoor thermostat, or the target flow temp. may not be maintained.**



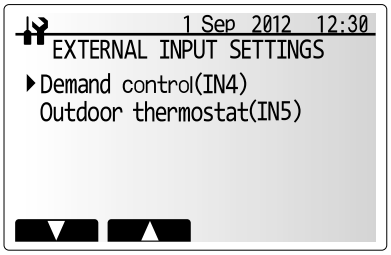


Functions		Symbol	Description	Option/Range	Unit	Default
Floor dry up function		a	Set the function to ON and power on the system using the main controller, and the dry up heating operation will start.	On/Off	—	Off
Flow temp. (increase)	Flow temp. increase step	b	Sets the increase step of the target flow temp.	+1 - +10	ºC	+5
	Increase interval	c	Sets the period for which the same target flow temp is maintained.	1 - 7	day	2
Flow temp. (decrease)	Flow temp. decrease step	d	Sets the decrease step of the target flow temp.	−1 - −10	ºC	−5
	Decrease interval	e	Sets the period for which the same target flow temp is maintained.	1 - 7	day	2
Target temperature	Start & Finish	f	Sets the target flow temp. at the start and the finish of the operation.	25 - 60	ºC	30
	Max. target temp.	g	Sets the maximum target flow temp.	25 - 60	ºC	45
	Max. temp. period	h	Sets the period for which the maximum target flow temp. is maintained.	1 - 20	day	5

External input settings

From the service menu use F1 and F2 buttons to highlight External input settings then press CONFIRM.

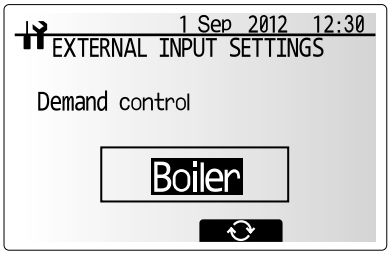
<Demand control (IN4)>
1. From the External input settings menu highlight Demand control (IN4).
2. Press CONFIRM.
3. The Demand control screen is displayed.



External input settings menu screen

4. Press F3 button to select Heat source OFF or Boiler.
5. Press CONFIRM.

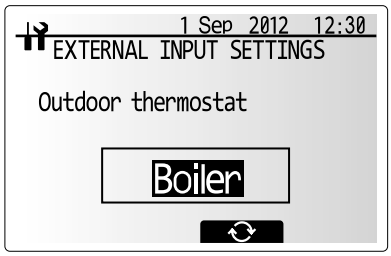
Note: The selection of "OFF", whilst a signal is being sent to IN4, forcefully stops all the heat source operations and the selection of "Boiler" stops operations of heat pump and electric heater and performs boiler operation.



Demand control screen

<Outdoor thermostat (IN5)>
1. From the External input settings menu highlight Outdoor thermostat (IN5).
2. Press CONFIRM.
3. The Outdoor thermostat screen is displayed.
4. Press F3 button to select Heater or Boiler.
5. Press CONFIRM.

Note: The selection of "Heater", whilst a signal is being sent to IN5, performs electric-heater-only operation and the selection of "Boiler" performs boiler operation.



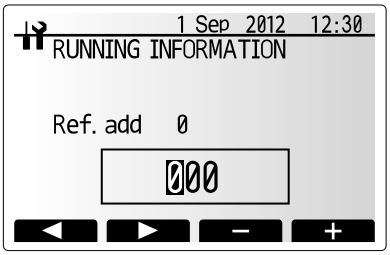
Outdoor thermostat setting screen

Running information

This function shows current temperature and other data of main component parts of both the indoor and outdoor units.

1. From the Service menu highlight Running information.
2. Press CONFIRM.
3. Press F3 and F4 buttons to set the Ref. address. *1
4. Use the function buttons to enter index code for the component to be viewed. (See the Table 9-2-1 for component index codes.)
5. Press CONFIRM.

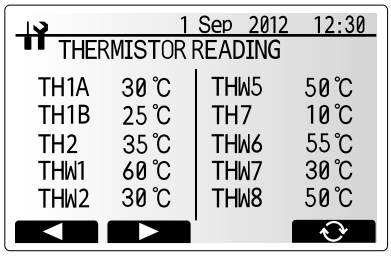
*1 For multiple outdoor units control system only.



Thermistor reading

This function shows the current readings of thermistors located on the water and refrigerant circuit

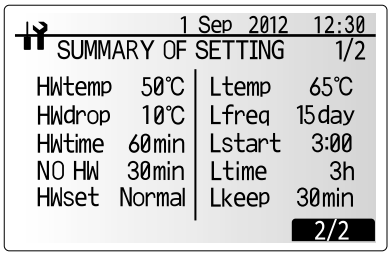
Thermistor	Description	Thermistor	Description
TH1A	Zone 1 room temperature	THW6	Zone 1 flow water temperature
TH1B	Zone 2 room temperature	THW7	Zone 1 return water temperature
TH2	Refrigerant return temperature	THW8	Zone 2 flow water temperature
THW1	Water flow temperature	THW9	Zone 2 return water temperature
THW2	Water return temperature	THWB1	Boiler flow water temperature
THW5	DHW tank water temperature	THWB2	Boiler return water temperature
TH7	Ambient (outdoor) temperature		

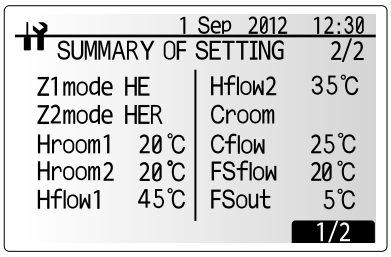


Summary of settings

This function shows the current installer/user entered settings.

Abbreviation	Explanation	Abbreviation	Explanation
HWtemp	DHW max temp	**Z2 mode**	Operation mode
HWdrop	DHW temperature drop		- HER (Heating room temp)
HWtime	DHW max operation time		- HE (Heating flow temp)
NO HW	DHW mode restriction		- HCC (Heating compensation curve)
HWset	DHW operation mode (Normal/Eco)		- COR (—)
			- CO (Cooling flow temp)
Ltemp	Legionella hot water temp	**Hroom 1**	Heating target room temp
Lfreq	Legionella operation Frequency	**Hroom 2**	Heating target room temp
Lstart	Legionella mode start time	**Hflow 1**	Heating target flow temp
Ltime	Legionella max. operation time	**Hflow 2**	Heating target flow temp
Lkeep	Duration of max (Legionella) hot water temp	**Croom**	—
		Cflow	Cooling target flow temp
Z1 mode	Operation mode	**FSflow**	Freeze stat function flow temp
	- HER (Heating room temp)	**FSout**	Freeze stat function ambient temp
	- HE (Heating flow temp)		
	- HCC (Heating compensation curve)		
	- COR (—)		
	- CO (Cooling flow temp)		





Error history

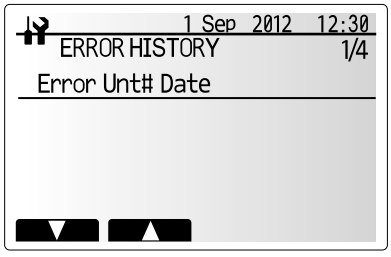
Error history allows the service engineer to view previous Error codes, the unit address and the date on which they occurred. Up to 16 Error codes can be stored in the history the most recent Error event is displayed at the top of the list.

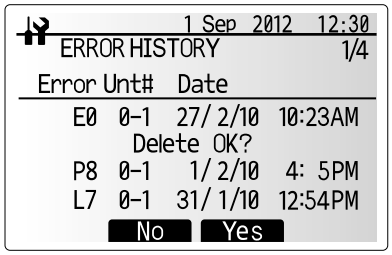
1. From the service menu select Error history
2. Press CONFIRM.

Please see chapter 10-4. for error code diagnosis and actions.

To delete an Error history item;

1. From Error history screen press F4 button (Rubbish bin icon)
2. Then press F3 button (Yes).





Password protection

Password protection is available to prevent unauthorised access to the service menu by untrained persons.

1. From the service menu use F1 and F2 buttons to scroll through list until *Password protection* is highlighted.
2. Press CONFIRM.
3. When password input screen is displayed use buttons F1 and F2 to move left and right between the four digits, F3 to lower the selected digit by 1, and F4 to increase the selected digit by 1.
4. When you have input your password press CONFIRM.

Password input screen

5. The password verify screen is displayed.
6. To verify your new password press button F3.
7. Your password is now set and the completion screen is displayed.

Password verify screen

<Resetting the password>

If you forget the password you entered, or have to service a unit somebody else installed, you can reset the password to the factory default of **0000**.

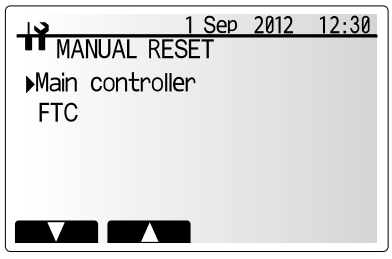
1. From the main settings menu scroll down the functions until Service Menu is highlighted.
2. Press CONFIRM.
3. You will be prompted to enter a password.
4. Hold down buttons F3 and F4 together for 3 secs
5. You will be asked if you wish to continue and reset the password to default setting.
6. To reset press button F3.
7. The password is now reset to **0000**.

Completion screen

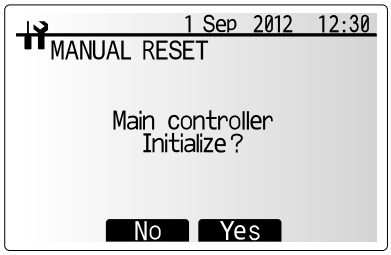
Manual reset

Should you wish to restore the factory settings at any time you should use the manual reset function. Please note this will reset ALL functions to the factory default settings.

1. From the service menu use F1 and F2 buttons to scroll through list until Manual Reset is highlighted.
2. Press CONFIRM.
3. The Manual reset screen is displayed.
4. Choose either Manual Reset for FTC4 or Main Controller.

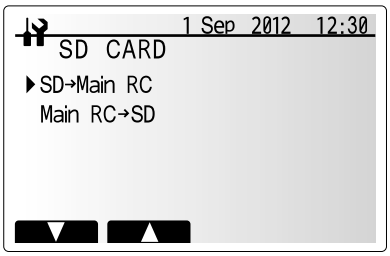


5. Press F3 button to confirm manual reset of chosen device.



SD card

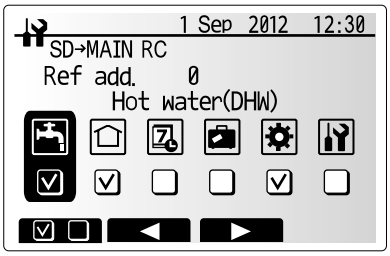
The use of an SD memory card simplifies the main controller settings in the field.
*Ecodan service tool (for use with PC tool) is necessary for the setting.



<SD → Main RC>

1. From the SD card setting use F1 and F2 buttons to scroll through list until "SD → Main RC" is highlighted.
2. Press CONFIRM.
3. Press F3 and F4 buttons to set the Ref. address. *1
4. Use F1, F2 and F3 buttons to select a menu to write to the main controller.
5. Press CONFIRM to start downloading.
6. Wait for a few minutes until "Complete!" appears.

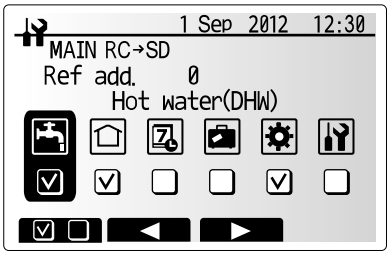
*1 For multiple outdoor units control system only.



<Main RC → SD>

1. From the SD card setting use F1 and F2 buttons to scroll through list until Main RC → SD is highlighted.
2. Press CONFIRM.
3. Press F3 and F4 buttons to set the Ref. address. *1
4. Use F1, F2 and F3 buttons to select a menu to write to the SD memory card.
5. Press CONFIRM to start uploading.
6. Wait for a few minutes until "Complete!" appears.

*1 For multiple outdoor units control system only.



<Table 9-2-1>

Request code	Request content	Range	Unit
103	Error history 1 (latest)	Displays error history. ("– –" is displays if no history is present.)	Code
104	Error history 2 (second to last)	Displays error history. ("– –" is displays if no history is present.)	—
105	Error history 3 (third to last)	Displays error history. ("– –" is displays if no history is present.)	—
154	Water circulation pump 1 - Accumulated operating time (after reset)	0 - 9999	10 hours
156	Water circulation pump 2 - Accumulated operating time (after reset)	0 - 9999	10 hours
157	Water circulation pump 3 - Accumulated operating time (after reset)	0 - 9999	10 hours
162	Indoor unit - Dip SW1 setting information	Refer to detail contents described hereinafter.	—
163	Indoor unit - Dip SW2 setting information	Refer to detail contents described hereinafter.	—
164	Indoor unit - Dip SW3 setting information	Refer to detail contents described hereinafter.	—
165	Indoor unit - Dip SW4 setting information	Refer to detail contents described hereinafter.	—
175	Indoor unit - Output signal information	Refer to detail contents described hereinafter.	—
176	Indoor unit - Input signal information	Refer to detail contents described hereinafter.	—
177	Mixing valve opening step	0 - 10	Step
190	Indoor unit - Software version 1st 4 digits	Refer to Note below.	—
191	Indoor unit - Software version last 4 digits	Refer to Note below.	—
340	Water circulation pump 1 - Accumulated operating time reset	—	—
342	Water circulation pump 2 - Accumulated operating time reset	—	—
343	Water circulation pump 3 - Accumulated operating time reset	—	—
504	Indoor unit - Zone 1 room temp. (TH1A)	–39 - 88	°C
505	Indoor unit - Ref. liquid temp. (TH2)	–39 - 88	°C
506	Indoor unit - Return water temp. (THW2)	–39 - 88	°C
507	Indoor unit - Zone 2 room temp. (TH1B)	–39 - 88	°C
508	Indoor unit - DHW tank water temp. (THW5)	–39 - 88	°C
509	Indoor unit - Zone 1 flow water temp. (THW6)	–39 - 88	°C
510	Indoor unit - Outside air temp. (TH7)	–39 - 88	°C
511	Indoor unit - Flow water temp. (THW1)	–39 - 88	°C
512	Indoor unit - Zone 1 return water temp. (THW7)	–39 - 88	°C
513	Indoor unit - Zone 2 flow water temp. (THW8)	–39 - 88	°C
514	Indoor unit - Zone 2 return water temp. (THW9)	–39 - 88	°C
515	Indoor unit - Boiler flow water temp. (THWB1)	–40 - 140	°C
516	Indoor unit - Boiler return water temp. (THWB2)	–40 - 140	°C
550	Indoor unit - Error postponement history 1 (latest)	Displays postponement code. ("– –" is displays if no postponement code is present.)	—
551	Indoor unit - Operation control at time of error	0 Standard, 1 Heater, 2 Boiler	—
552	Indoor unit - Operation mode at time of error	0 OFF, 1 DHW, 2 Heating, 3 Cooling 4, Legionella prevention, 5 Freeze protection, 6 Operation stop	—
553	Indoor unit - Output signal information at time of error	Refer to detail contents described hereinafter	—
554	Indoor unit - Input signal information at time of error	Refer to detail contents described hereinafter	—
555	Indoor unit - Zone 1 room temp. (TH1A) at time of error	–39 - 88	°C
556	Indoor unit - Zone 2 room temp. (TH1B) at time of error	–39 - 88	°C
557	Indoor unit - Ref. liquid temp. (TH2) at time of error	–39 - 88	°C
558	Indoor unit - Flow water temp. (THW1) at time of error	–39 - 88	°C
559	Indoor unit - Return water temp. (THW2) at time of error	–39 - 88	°C
560	Indoor unit - DHW tank water temp. (THW5) at time of error	–39 - 88	°C
561	Indoor unit - Zone 1 flow water temp. (THW6) at time of error	–39 - 88	°C
562	Indoor unit - Zone 1 return water temp. (THW7) at time of error	–39 - 88	°C
563	Indoor unit - Zone 2 flow water temp. (THW8) at time of error	–39 - 88	°C
564	Indoor unit - Zone 2 return water temp. (THW9) at time of error	–39 - 88	°C
565	Indoor unit - Boiler flow water temp. (THWB1) at time of error	–40 - 140	°C
566	Indoor unit - Boiler return water temp. (THWB2) at time of error	–40 - 140	°C
567	Indoor unit - Failure (P1/P2/L5/L8/Ld) thermistor	0 Failure thermistor is none, 1 TH1A, 2 TH2, 3 THW1, 4 THW2, 5 THWB1, 6 THW5, 7 THWB2, 8 TH1B, A THW6, B THW7, C THW8, D THW9	—
568	Mixing valve opening step at time of error	0 - 10	Step
569	Operated Flow switch at time of failure (L9)	0 No operated flow switch, 1 Flow switch 1, 2 Flow switch 2, 3 Flow switch 3	—

Note
Refer to outdoor unit service manual for request code 0 to 102, 106 to 149.
Request codes 103 to 105 indicate error histories of both indoor and outdoor units.
As only four digits can be displayed at one time the software version number is displayed in two halves.
Enter code 190 to see the first four digits and code 191 to see the last four digits.
For example software version No. 5.01 A000, when code 190 is entered 0501 is displayed, when code 191 is entered A000 is displayed.

Indoor unit switch setting display (Request code: 162 to 165)

0: OFF 1: ON

SW1, SW2, SW3, SW4								Display
1	2	3	4	5	6	7	8	
0	0	0	0	0	0	0	0	00 00
1	0	0	0	0	0	0	0	00 01
0	1	0	0	0	0	0	0	00 02
1	1	0	0	0	0	0	0	00 03
0	0	1	0	0	0	0	0	00 04
1	0	1	0	0	0	0	0	00 05
0	1	1	0	0	0	0	0	00 06
1	1	1	0	0	0	0	0	00 07
0	0	0	1	0	0	0	0	00 08
1	0	0	1	0	0	0	0	00 09
0	1	0	1	0	0	0	0	00 0A
1	1	0	1	0	0	0	0	00 0B
0	0	1	1	0	0	0	0	00 0C
1	0	1	1	0	0	0	0	00 0D
0	1	1	1	0	0	0	0	00 0E
1	1	1	1	0	0	0	0	00 0F
0	0	0	0	1	0	0	0	00 10
1	0	0	0	1	0	0	0	00 11
0	1	0	0	1	0	0	0	00 12
1	1	0	0	1	0	0	0	00 13
0	0	1	0	1	0	0	0	00 14
1	0	1	0	1	0	0	0	00 15
0	1	1	0	1	0	0	0	00 16
1	1	1	0	1	0	0	0	00 17
0	0	0	1	1	0	0	0	00 18
1	0	0	1	1	0	0	0	00 19
0	1	0	1	1	0	0	0	00 1A
1	1	0	1	1	0	0	0	00 1B
0	0	1	1	1	0	0	0	00 1C
1	0	1	1	1	0	0	0	00 1D
0	1	1	1	1	0	0	0	00 1E
1	1	1	1	1	0	0	0	00 1F
0	0	0	0	0	1	0	0	00 20
1	0	0	0	0	1	0	0	00 21
0	1	0	0	0	1	0	0	00 22
1	1	0	0	0	1	0	0	00 23
0	0	1	0	0	1	0	0	00 24
1	0	1	0	0	1	0	0	00 25
0	1	1	0	0	1	0	0	00 26
1	1	1	0	0	1	0	0	00 27
0	0	0	1	0	1	0	0	00 28
1	0	0	1	0	1	0	0	00 29
0	1	0	1	0	1	0	0	00 2A
1	1	0	1	0	1	0	0	00 2B
0	0	1	1	0	1	0	0	00 2C
1	0	1	1	0	1	0	0	00 2D
0	1	1	1	0	1	0	0	00 2E
1	1	1	1	0	1	0	0	00 2F
0	0	0	0	1	1	0	0	00 30
1	0	0	0	1	1	0	0	00 31
0	1	0	0	1	1	0	0	00 32
1	1	0	0	1	1	0	0	00 33
0	0	1	0	1	1	0	0	00 34
1	0	1	0	1	1	0	0	00 35
0	1	1	0	1	1	0	0	00 36
1	1	1	0	1	1	0	0	00 37
0	0	0	1	1	1	0	0	00 38
1	0	0	1	1	1	0	0	00 39
0	1	0	1	1	1	0	0	00 3A
1	1	0	1	1	1	0	0	00 3B
0	0	1	1	1	1	0	0	00 3C
1	0	1	1	1	1	0	0	00 3D
0	1	1	1	1	1	0	0	00 3E
1	1	1	1	1	1	0	0	00 3F

0: OFF 1: ON

SW1, SW2, SW3, SW4								Display
1	2	3	4	5	6	7	8	
0	0	0	0	0	0	1	0	00 40
1	0	0	0	0	0	1	0	00 41
0	1	0	0	0	0	1	0	00 42
1	1	0	0	0	0	1	0	00 43
0	0	1	0	0	0	1	0	00 44
1	0	1	0	0	0	1	0	00 45
0	1	1	0	0	0	1	0	00 46
1	1	1	0	0	0	1	0	00 47
0	0	0	1	0	0	1	0	00 48
1	0	0	1	0	0	1	0	00 49
0	1	0	1	0	0	1	0	00 4A
1	1	0	1	0	0	1	0	00 4B
0	0	1	1	0	0	1	0	00 4C
1	0	1	1	0	0	1	0	00 4D
0	1	1	1	0	0	1	0	00 4E
1	1	1	1	0	0	1	0	00 4F
0	0	0	0	1	0	1	0	00 50
1	0	0	0	1	0	1	0	00 51
0	1	0	0	1	0	1	0	00 52
1	1	0	0	1	0	1	0	00 53
0	0	1	0	1	0	1	0	00 54
1	0	1	0	1	0	1	0	00 55
0	1	1	0	1	0	1	0	00 56
1	1	1	0	1	0	1	0	00 57
0	0	0	1	1	0	1	0	00 58
1	0	0	1	1	0	1	0	00 59
0	1	0	1	1	0	1	0	00 5A
1	1	0	1	1	0	1	0	00 5B
0	0	1	1	1	0	1	0	00 5C
1	0	1	1	1	0	1	0	00 5D
0	1	1	1	1	0	1	0	00 5E
1	1	1	1	1	0	1	0	00 5F
0	0	0	0	0	1	1	0	00 60
1	0	0	0	0	1	1	0	00 61
0	1	0	0	0	1	1	0	00 62
1	1	0	0	0	1	1	0	00 63
0	0	1	0	0	1	1	0	00 64
1	0	1	0	0	1	1	0	00 65
0	1	1	0	0	1	1	0	00 66
1	1	1	0	0	1	1	0	00 67
0	0	0	1	0	1	1	0	00 68
1	0	0	1	0	1	1	0	00 69
0	1	0	1	0	1	1	0	00 6A
1	1	0	1	0	1	1	0	00 6B
0	0	1	1	0	1	1	0	00 6C
1	0	1	1	0	1	1	0	00 6D
0	1	1	1	0	1	1	0	00 6E
1	1	1	1	0	1	1	0	00 6F
0	0	0	0	1	1	1	0	00 70
1	0	0	0	1	1	1	0	00 71
0	1	0	0	1	1	1	0	00 72
1	1	0	0	1	1	1	0	00 73
0	0	1	0	1	1	1	0	00 74
1	0	1	0	1	1	1	0	00 75
0	1	1	0	1	1	1	0	00 76
1	1	1	0	1	1	1	0	00 77
0	0	0	1	1	1	1	0	00 78
1	0	0	1	1	1	1	0	00 79
0	1	0	1	1	1	1	0	00 7A
1	1	0	1	1	1	1	0	00 7B
0	0	1	1	1	1	1	0	00 7C
1	0	1	1	1	1	1	0	00 7D
0	1	1	1	1	1	1	0	00 7E
1	1	1	1	1	1	1	0	00 7F

Indoor unit switch setting display (Request code: 162 to 165)

0: OFF 1: ON

SW1, SW2, SW3, SW4								Display
1	2	3	4	5	6	7	8	
0	0	0	0	0	0	0	1	00 80
1	0	0	0	0	0	0	1	00 81
0	1	0	0	0	0	0	1	00 82
1	1	0	0	0	0	0	1	00 83
0	0	1	0	0	0	0	1	00 84
1	0	1	0	0	0	0	1	00 85
0	1	1	0	0	0	0	1	00 86
1	1	1	0	0	0	0	1	00 87
0	0	0	1	0	0	0	1	00 88
1	0	0	1	0	0	0	1	00 89
0	1	0	1	0	0	0	1	00 8A
1	1	0	1	0	0	0	1	00 8B
0	0	1	1	0	0	0	1	00 8C
1	0	1	1	0	0	0	1	00 8D
0	1	1	1	0	0	0	1	00 8E
1	1	1	1	0	0	0	1	00 8F
0	0	0	0	1	0	0	1	00 90
1	0	0	0	1	0	0	1	00 91
0	1	0	0	1	0	0	1	00 92
1	1	0	0	1	0	0	1	00 93
0	0	1	0	1	0	0	1	00 94
1	0	1	0	1	0	0	1	00 95
0	1	1	0	1	0	0	1	00 96
1	1	1	0	1	0	0	1	00 97
0	0	0	1	1	0	0	1	00 98
1	0	0	1	1	0	0	1	00 99
0	1	0	1	1	0	0	1	00 9A
1	1	0	1	1	0	0	1	00 9B
0	0	1	1	1	0	0	1	00 9C
1	0	1	1	1	0	0	1	00 9D
0	1	1	1	1	0	0	1	00 9E
1	1	1	1	1	0	0	1	00 9F
0	0	0	0	0	1	0	1	00 A0
1	0	0	0	0	1	0	1	00 A1
0	1	0	0	0	1	0	1	00 A2
1	1	0	0	0	1	0	1	00 A3
0	0	1	0	0	1	0	1	00 A4
1	0	1	0	0	1	0	1	00 A5
0	1	1	0	0	1	0	1	00 A6
1	1	1	0	0	1	0	1	00 A7
0	0	0	1	0	1	0	1	00 A8
1	0	0	1	0	1	0	1	00 A9
0	1	0	1	0	1	0	1	00 AA
1	1	0	1	0	1	0	1	00 AB
0	0	1	1	0	1	0	1	00 AC
1	0	1	1	0	1	0	1	00 AD
0	1	1	1	0	1	0	1	00 AE
1	1	1	1	0	1	0	1	00 AF
0	0	0	0	1	1	0	1	00 B0
1	0	0	0	1	1	0	1	00 B1
0	1	0	0	1	1	0	1	00 B2
1	1	0	0	1	1	0	1	00 B3
0	0	1	0	1	1	0	1	00 B4
1	0	1	0	1	1	0	1	00 B5
0	1	1	0	1	1	0	1	00 B6
1	1	1	0	1	1	0	1	00 B7
0	0	0	1	1	1	0	1	00 B8
1	0	0	1	1	1	0	1	00 B9
0	1	0	1	1	1	0	1	00 BA
1	1	0	1	1	1	0	1	00 BB
0	0	1	1	1	1	0	1	00 BC
1	0	1	1	1	1	0	1	00 BD
0	1	1	1	1	1	0	1	00 BE
1	1	1	1	1	1	0	1	00 BF

0: OFF 1: ON

SW1, SW2, SW3, SW4								Display
1	2	3	4	5	6	7	8	
0	0	0	0	0	0	1	1	00 C0
1	0	0	0	0	0	1	1	00 C1
0	1	0	0	0	0	1	1	00 C2
1	1	0	0	0	0	1	1	00 C3
0	0	1	0	0	0	1	1	00 C4
1	0	1	0	0	0	1	1	00 C5
0	1	1	0	0	0	1	1	00 C6
1	1	1	0	0	0	1	1	00 C7
0	0	0	1	0	0	1	1	00 C8
1	0	0	1	0	0	1	1	00 C9
0	1	0	1	0	0	1	1	00 CA
1	1	0	1	0	0	1	1	00 CB
0	0	1	1	0	0	1	1	00 CC
1	0	1	1	0	0	1	1	00 CD
0	1	1	1	0	0	1	1	00 CE
1	1	1	1	0	0	1	1	00 CF
0	0	0	0	1	0	1	1	00 D0
1	0	0	0	1	0	1	1	00 D1
0	1	0	0	1	0	1	1	00 D2
1	1	0	0	1	0	1	1	00 D3
0	0	1	0	1	0	1	1	00 D4
1	0	1	0	1	0	1	1	00 D5
0	1	1	0	1	0	1	1	00 D6
1	1	1	0	1	0	1	1	00 D7
0	0	0	1	1	0	1	1	00 D8
1	0	0	1	1	0	1	1	00 D9
0	1	0	1	1	0	1	1	00 DA
1	1	0	1	1	0	1	1	00 DB
0	0	1	1	1	0	1	1	00 DC
1	0	1	1	1	0	1	1	00 DD
0	1	1	1	1	0	1	1	00 DE
1	1	1	1	1	0	1	1	00 DF
0	0	0	0	0	1	1	1	00 E0
1	0	0	0	0	1	1	1	00 E1
0	1	0	0	0	1	1	1	00 E2
1	1	0	0	0	1	1	1	00 E3
0	0	1	0	0	1	1	1	00 E4
1	0	1	0	0	1	1	1	00 E5
0	1	1	0	0	1	1	1	00 E6
1	1	1	0	0	1	1	1	00 E7
0	0	0	1	0	1	1	1	00 E8
1	0	0	1	0	1	1	1	00 E9
0	1	0	1	0	1	1	1	00 EA
1	1	0	1	0	1	1	1	00 EB
0	0	1	1	0	1	1	1	00 EC
1	0	1	1	0	1	1	1	00 ED
0	1	1	1	0	1	1	1	00 EE
1	1	1	1	0	1	1	1	00 EF
0	0	0	0	1	1	1	1	00 F0
1	0	0	0	1	1	1	1	00 F1
0	1	0	0	1	1	1	1	00 F2
1	1	0	0	1	1	1	1	00 F3
0	0	1	0	1	1	1	1	00 F4
1	0	1	0	1	1	1	1	00 F5
0	1	1	0	1	1	1	1	00 F6
1	1	1	0	1	1	1	1	00 F7
0	0	0	1	1	1	1	1	00 F8
1	0	0	1	1	1	1	1	00 F9
0	1	0	1	1	1	1	1	00 FA
1	1	0	1	1	1	1	1	00 FB
0	0	1	1	1	1	1	1	00 FC
1	0	1	1	1	1	1	1	00 FD
0	1	1	1	1	1	1	1	00 FE
1	1	1	1	1	1	1	1	00 FF

Output signal display (Request code: 175/553)

Please refer to Table 2 on relevant wiring diagram whilst using the following.

0: OFF 1: ON

OUT								Display
1	2	3	4	5A	5B	6	7	
0	0	0	0	0	0	0	0	xx 00
1	0	0	0	0	0	0	0	xx 01
0	1	0	0	0	0	0	0	xx 02
1	1	0	0	0	0	0	0	xx 03
0	0	1	0	0	0	0	0	xx 04
1	0	1	0	0	0	0	0	xx 05
0	1	1	0	0	0	0	0	xx 06
1	1	1	0	0	0	0	0	xx 07
0	0	0	1	0	0	0	0	xx 08
1	0	0	1	0	0	0	0	xx 09
0	1	0	1	0	0	0	0	xx 0A
1	1	0	1	0	0	0	0	xx 0B
0	0	1	1	0	0	0	0	xx 0C
1	0	1	1	0	0	0	0	xx 0D
0	1	1	1	0	0	0	0	xx 0E
1	1	1	1	0	0	0	0	xx 0F
0	0	0	0	1	0	0	0	xx 10
1	0	0	0	1	0	0	0	xx 11
0	1	0	0	1	0	0	0	xx 12
1	1	0	0	1	0	0	0	xx 13
0	0	1	0	1	0	0	0	xx 14
1	0	1	0	1	0	0	0	xx 15
0	1	1	0	1	0	0	0	xx 16
1	1	1	0	1	0	0	0	xx 17
0	0	0	1	1	0	0	0	xx 18
1	0	0	1	1	0	0	0	xx 19
0	1	0	1	1	0	0	0	xx 1A
1	1	0	1	1	0	0	0	xx 1B
0	0	1	1	1	0	0	0	xx 1C
1	0	1	1	1	0	0	0	xx 1D
0	1	1	1	1	0	0	0	xx 1E
1	1	1	1	1	0	0	0	xx 1F
0	0	0	0	0	1	0	0	xx 20
1	0	0	0	0	1	0	0	xx 21
0	1	0	0	0	1	0	0	xx 22
1	1	0	0	0	1	0	0	xx 23
0	0	1	0	0	1	0	0	xx 24
1	0	1	0	0	1	0	0	xx 25
0	1	1	0	0	1	0	0	xx 26
1	1	1	0	0	1	0	0	xx 27
0	0	0	1	0	1	0	0	xx 28
1	0	0	1	0	1	0	0	xx 29
0	1	0	1	0	1	0	0	xx 2A
1	1	0	1	0	1	0	0	xx 2B
0	0	1	1	0	1	0	0	xx 2C
1	0	1	1	0	1	0	0	xx 2D
0	1	1	1	0	1	0	0	xx 2E
1	1	1	1	0	1	0	0	xx 2F
0	0	0	0	1	1	0	0	xx 30
1	0	0	0	1	1	0	0	xx 31
0	1	0	0	1	1	0	0	xx 32
1	1	0	0	1	1	0	0	xx 33
0	0	1	0	1	1	0	0	xx 34
1	0	1	0	1	1	0	0	xx 35
0	1	1	0	1	1	0	0	xx 36
1	1	1	0	1	1	0	0	xx 37
0	0	0	1	1	1	0	0	xx 38
1	0	0	1	1	1	0	0	xx 39
0	1	0	1	1	1	0	0	xx 3A
1	1	0	1	1	1	0	0	xx 3B
0	0	1	1	1	1	0	0	xx 3C
1	0	1	1	1	1	0	0	xx 3D
0	1	1	1	1	1	0	0	xx 3E
1	1	1	1	1	1	0	0	xx 3F

0: OFF 1: ON

OUT								Display
1	2	3	4	5A	5B	6	7	
0	0	0	0	0	0	1	0	xx 40
1	0	0	0	0	0	1	0	xx 41
0	1	0	0	0	0	1	0	xx 42
1	1	0	0	0	0	1	0	xx 43
0	0	1	0	0	0	1	0	xx 44
1	0	1	0	0	0	1	0	xx 45
0	1	1	0	0	0	1	0	xx 46
1	1	1	0	0	0	1	0	xx 47
0	0	0	1	0	0	1	0	xx 48
1	0	0	1	0	0	1	0	xx 49
0	1	0	1	0	0	1	0	xx 4A
1	1	0	1	0	0	1	0	xx 4B
0	0	1	1	0	0	1	0	xx 4C
1	0	1	1	0	0	1	0	xx 4D
0	1	1	1	0	0	1	0	xx 4E
1	1	1	1	0	0	1	0	xx 4F
0	0	0	0	1	0	1	0	xx 50
1	0	0	0	1	0	1	0	xx 51
0	1	0	0	1	0	1	0	xx 52
1	1	0	0	1	0	1	0	xx 53
0	0	1	0	1	0	1	0	xx 54
1	0	1	0	1	0	1	0	xx 55
0	1	1	0	1	0	1	0	xx 56
1	1	1	0	1	0	1	0	xx 57
0	0	0	1	1	0	1	0	xx 58
1	0	0	1	1	0	1	0	xx 59
0	1	0	1	1	0	1	0	xx 5A
1	1	0	1	1	0	1	0	xx 5B
0	0	1	1	1	0	1	0	xx 5C
1	0	1	1	1	0	1	0	xx 5D
0	1	1	1	1	0	1	0	xx 5E
1	1	1	1	1	0	1	0	xx 5F
0	0	0	0	0	1	1	0	xx 60
1	0	0	0	0	1	1	0	xx 61
0	1	0	0	0	1	1	0	xx 62
1	1	0	0	0	1	1	0	xx 63
0	0	1	0	0	1	1	0	xx 64
1	0	1	0	0	1	1	0	xx 65
0	1	1	0	0	1	1	0	xx 66
1	1	1	0	0	1	1	0	xx 67
0	0	0	1	0	1	1	0	xx 68
1	0	0	1	0	1	1	0	xx 69
0	1	0	1	0	1	1	0	xx 6A
1	1	0	1	0	1	1	0	xx 6B
0	0	1	1	0	1	1	0	xx 6C
1	0	1	1	0	1	1	0	xx 6D
0	1	1	1	0	1	1	0	xx 6E
1	1	1	1	0	1	1	0	xx 6F
0	0	0	0	1	1	1	0	xx 70
1	0	0	0	1	1	1	0	xx 71
0	1	0	0	1	1	1	0	xx 72
1	1	0	0	1	1	1	0	xx 73
0	0	1	0	1	1	1	0	xx 74
1	0	1	0	1	1	1	0	xx 75
0	1	1	0	1	1	1	0	xx 76
1	1	1	0	1	1	1	0	xx 77
0	0	0	1	1	1	1	0	xx 78
1	0	0	1	1	1	1	0	xx 79
0	1	0	1	1	1	1	0	xx 7A
1	1	0	1	1	1	1	0	xx 7B
0	0	1	1	1	1	1	0	xx 7C
1	0	1	1	1	1	1	0	xx 7D
0	1	1	1	1	1	1	0	xx 7E
1	1	1	1	1	1	1	0	xx 7F

Output signal display (Request code: 175/553)

Please refer to Table 2 on relevant wiring diagram whilst using the following.

0: OFF 1: ON

OUT								Display
1	2	3	4	5A	5B	6	7	
0	0	0	0	0	0	0	1	xx 80
1	0	0	0	0	0	0	1	xx 81
0	1	0	0	0	0	0	1	xx 82
1	1	0	0	0	0	0	1	xx 83
0	0	1	0	0	0	0	1	xx 84
1	0	1	0	0	0	0	1	xx 85
0	1	1	0	0	0	0	1	xx 86
1	1	1	0	0	0	0	1	xx 87
0	0	0	1	0	0	0	1	xx 88
1	0	0	1	0	0	0	1	xx 89
0	1	0	1	0	0	0	1	xx 8A
1	1	0	1	0	0	0	1	xx 8B
0	0	1	1	0	0	0	1	xx 8C
1	0	1	1	0	0	0	1	xx 8D
0	1	1	1	0	0	0	1	xx 8E
1	1	1	1	0	0	0	1	xx 8F
0	0	0	0	1	0	0	1	xx 90
1	0	0	0	1	0	0	1	xx 91
0	1	0	0	1	0	0	1	xx 92
1	1	0	0	1	0	0	1	xx 93
0	0	1	0	1	0	0	1	xx 94
1	0	1	0	1	0	0	1	xx 95
0	1	1	0	1	0	0	1	xx 96
1	1	1	0	1	0	0	1	xx 97
0	0	0	1	1	0	0	1	xx 98
1	0	0	1	1	0	0	1	xx 99
0	1	0	1	1	0	0	1	xx 9A
1	1	0	1	1	0	0	1	xx 9B
0	0	1	1	1	0	0	1	xx 9C
1	0	1	1	1	0	0	1	xx 9D
0	1	1	1	1	0	0	1	xx 9E
1	1	1	1	1	0	0	1	xx 9F
0	0	0	0	0	1	0	1	xx A0
1	0	0	0	0	1	0	1	xx A1
0	1	0	0	0	1	0	1	xx A2
1	1	0	0	0	1	0	1	xx A3
0	0	1	0	0	1	0	1	xx A4
1	0	1	0	0	1	0	1	xx A5
0	1	1	0	0	1	0	1	xx A6
1	1	1	0	0	1	0	1	xx A7
0	0	0	1	0	1	0	1	xx A8
1	0	0	1	0	1	0	1	xx A9
0	1	0	1	0	1	0	1	xx AA
1	1	0	1	0	1	0	1	xx AB
0	0	1	1	0	1	0	1	xx AC
1	0	1	1	0	1	0	1	xx AD
0	1	1	1	0	1	0	1	xx AE
1	1	1	1	0	1	0	1	xx AF
0	0	0	0	1	1	0	1	xx B0
1	0	0	0	1	1	0	1	xx B1
0	1	0	0	1	1	0	1	xx B2
1	1	0	0	1	1	0	1	xx B3
0	0	1	0	1	1	0	1	xx B4
1	0	1	0	1	1	0	1	xx B5
0	1	1	0	1	1	0	1	xx B6
1	1	1	0	1	1	0	1	xx B7
0	0	0	1	1	1	0	1	xx B8
1	0	0	1	1	1	0	1	xx B9
0	1	0	1	1	1	0	1	xx BA
1	1	0	1	1	1	0	1	xx BB
0	0	1	1	1	1	0	1	xx BC
1	0	1	1	1	1	0	1	xx BD
0	1	1	1	1	1	0	1	xx BE
1	1	1	1	1	1	0	1	xx BF

0: OFF 1: ON

OUT								Display
1	2	3	4	5A	5B	6	7	
0	0	0	0	0	0	1	1	xx C0
1	0	0	0	0	0	1	1	xx C1
0	1	0	0	0	0	1	1	xx C2
1	1	0	0	0	0	1	1	xx C3
0	0	1	0	0	0	1	1	xx C4
1	0	1	0	0	0	1	1	xx C5
0	1	1	0	0	0	1	1	xx C6
1	1	1	0	0	0	1	1	xx C7
0	0	0	1	0	0	1	1	xx C8
1	0	0	1	0	0	1	1	xx C9
0	1	0	1	0	0	1	1	xx CA
1	1	0	1	0	0	1	1	xx CB
0	0	1	1	0	0	1	1	xx CC
1	0	1	1	0	0	1	1	xx CD
0	1	1	1	0	0	1	1	xx CE
1	1	1	1	0	0	1	1	xx CF
0	0	0	0	1	0	1	1	xx D0
1	0	0	0	1	0	1	1	xx D1
0	1	0	0	1	0	1	1	xx D2
1	1	0	0	1	0	1	1	xx D3
0	0	1	0	1	0	1	1	xx D4
1	0	1	0	1	0	1	1	xx D5
0	1	1	0	1	0	1	1	xx D6
1	1	1	0	1	0	1	1	xx D7
0	0	0	1	1	0	1	1	xx D8
1	0	0	1	1	0	1	1	xx D9
0	1	0	1	1	0	1	1	xx DA
1	1	0	1	1	0	1	1	xx DB
0	0	1	1	1	0	1	1	xx DC
1	0	1	1	1	0	1	1	xx DD
0	1	1	1	1	0	1	1	xx DE
1	1	1	1	1	0	1	1	xx DF
0	0	0	0	0	1	1	1	xx E0
1	0	0	0	0	1	1	1	xx E1
0	1	0	0	0	1	1	1	xx E2
1	1	0	0	0	1	1	1	xx E3
0	0	1	0	0	1	1	1	xx E4
1	0	1	0	0	1	1	1	xx E5
0	1	1	0	0	1	1	1	xx E6
1	1	1	0	0	1	1	1	xx E7
0	0	0	1	0	1	1	1	xx E8
1	0	0	1	0	1	1	1	xx E9
0	1	0	1	0	1	1	1	xx EA
1	1	0	1	0	1	1	1	xx EB
0	0	1	1	0	1	1	1	xx EC
1	0	1	1	0	1	1	1	xx ED
0	1	1	1	0	1	1	1	xx EE
1	1	1	1	0	1	1	1	xx EF
0	0	0	0	1	1	1	1	xx F0
1	0	0	0	1	1	1	1	xx F1
0	1	0	0	1	1	1	1	xx F2
1	1	0	0	1	1	1	1	xx F3
0	0	1	0	1	1	1	1	xx F4
1	0	1	0	1	1	1	1	xx F5
0	1	1	0	1	1	1	1	xx F6
1	1	1	0	1	1	1	1	xx F7
0	0	0	1	1	1	1	1	xx F8
1	0	0	1	1	1	1	1	xx F9
0	1	0	1	1	1	1	1	xx FA
1	1	0	1	1	1	1	1	xx FB
0	0	1	1	1	1	1	1	xx FC
1	0	1	1	1	1	1	1	xx FD
0	1	1	1	1	1	1	1	xx FE
1	1	1	1	1	1	1	1	xx FF

Output signal display (Request code: 175/553)

Please refer to Table 2 on relevant wiring diagram whilst using the following.

0: OFF 1: ON

OUT								Display
8	9	10	11	12	13	14	15	
0	0	0	0	0	0	0	0	00 xx
1	0	0	0	0	0	0	0	01 xx
0	1	0	0	0	0	0	0	02 xx
1	1	0	0	0	0	0	0	03 xx
0	0	1	0	0	0	0	0	04 xx
1	0	1	0	0	0	0	0	05 xx
0	1	1	0	0	0	0	0	06 xx
1	1	1	0	0	0	0	0	07 xx
0	0	0	1	0	0	0	0	08 xx
1	0	0	1	0	0	0	0	09 xx
0	1	0	1	0	0	0	0	0A xx
1	1	0	1	0	0	0	0	0B xx
0	0	1	1	0	0	0	0	0C xx
1	0	1	1	0	0	0	0	0D xx
0	1	1	1	0	0	0	0	0E xx
1	1	1	1	0	0	0	0	0F xx
0	0	0	0	1	0	0	0	10 xx
1	0	0	0	1	0	0	0	11 xx
0	1	0	0	1	0	0	0	12 xx
1	1	0	0	1	0	0	0	13 xx
0	0	1	0	1	0	0	0	14 xx
1	0	1	0	1	0	0	0	15 xx
0	1	1	0	1	0	0	0	16 xx
1	1	1	0	1	0	0	0	17 xx
0	0	0	1	1	0	0	0	18 xx
1	0	0	1	1	0	0	0	19 xx
0	1	0	1	1	0	0	0	1A xx
1	1	0	1	1	0	0	0	1B xx
0	0	1	1	1	0	0	0	1C xx
1	0	1	1	1	0	0	0	1D xx
0	1	1	1	1	0	0	0	1E xx
1	1	1	1	1	0	0	0	1F xx
0	0	0	0	0	1	0	0	20 xx
1	0	0	0	0	1	0	0	21 xx
0	1	0	0	0	1	0	0	22 xx
1	1	0	0	0	1	0	0	23 xx
0	0	1	0	0	1	0	0	24 xx
1	0	1	0	0	1	0	0	25 xx
0	1	1	0	0	1	0	0	26 xx
1	1	1	0	0	1	0	0	27 xx
0	0	0	1	0	1	0	0	28 xx
1	0	0	1	0	1	0	0	29 xx
0	1	0	1	0	1	0	0	2A xx
1	1	0	1	0	1	0	0	2B xx
0	0	1	1	0	1	0	0	2C xx
1	0	1	1	0	1	0	0	2D xx
0	1	1	1	0	1	0	0	2E xx
1	1	1	1	0	1	0	0	2F xx
0	0	0	0	1	1	0	0	30 xx
1	0	0	0	1	1	0	0	31 xx
0	1	0	0	1	1	0	0	32 xx
1	1	0	0	1	1	0	0	33 xx
0	0	1	0	1	1	0	0	34 xx
1	0	1	0	1	1	0	0	35 xx
0	1	1	0	1	1	0	0	36 xx
1	1	1	0	1	1	0	0	37 xx
0	0	0	1	1	1	0	0	38 xx
1	0	0	1	1	1	0	0	39 xx
0	1	0	1	1	1	0	0	3A xx
1	1	0	1	1	1	0	0	3B xx
0	0	1	1	1	1	0	0	3C xx
1	0	1	1	1	1	0	0	3D xx
0	1	1	1	1	1	0	0	3E xx
1	1	1	1	1	1	0	0	3F xx

Mixing valve state

OUT		Mixing valve state
5A	5B	
0	0	Stop
0	1	Stop
1	0	Open
1	1	Close

Input signal display (Request code: 176/554)

Please refer to Table 1 on relevant wiring diagram whilst using the following.

0: OFF (open) 1: ON (short)

IN								Display
1	2	3	4	5	6	7	8	
0	0	0	0	0	0	0	0	00 00
1	0	0	0	0	0	0	0	00 01
0	1	0	0	0	0	0	0	00 02
1	1	0	0	0	0	0	0	00 03
0	0	1	0	0	0	0	0	00 04
1	0	1	0	0	0	0	0	00 05
0	1	1	0	0	0	0	0	00 06
1	1	1	0	0	0	0	0	00 07
0	0	0	1	0	0	0	0	00 08
1	0	0	1	0	0	0	0	00 09
0	1	0	1	0	0	0	0	00 0A
1	1	0	1	0	0	0	0	00 0B
0	0	1	1	0	0	0	0	00 0C
1	0	1	1	0	0	0	0	00 0D
0	1	1	1	0	0	0	0	00 0E
1	1	1	1	0	0	0	0	00 0F
0	0	0	0	1	0	0	0	00 10
1	0	0	0	1	0	0	0	00 11
0	1	0	0	1	0	0	0	00 12
1	1	0	0	1	0	0	0	00 13
0	0	1	0	1	0	0	0	00 14
1	0	1	0	1	0	0	0	00 15
0	1	1	0	1	0	0	0	00 16
1	1	1	0	1	0	0	0	00 17
0	0	0	1	1	0	0	0	00 18
1	0	0	1	1	0	0	0	00 19
0	1	0	1	1	0	0	0	00 1A
1	1	0	1	1	0	0	0	00 1B
0	0	1	1	1	0	0	0	00 1C
1	0	1	1	1	0	0	0	00 1D
0	1	1	1	1	0	0	0	00 1E
1	1	1	1	1	0	0	0	00 1F
0	0	0	0	0	1	0	0	00 20
1	0	0	0	0	1	0	0	00 21
0	1	0	0	0	1	0	0	00 22
1	1	0	0	0	1	0	0	00 23
0	0	1	0	0	1	0	0	00 24
1	0	1	0	0	1	0	0	00 25
0	1	1	0	0	1	0	0	00 26
1	1	1	0	0	1	0	0	00 27
0	0	0	1	0	1	0	0	00 28
1	0	0	1	0	1	0	0	00 29
0	1	0	1	0	1	0	0	00 2A
1	1	0	1	0	1	0	0	00 2B
0	0	1	1	0	1	0	0	00 2C
1	0	1	1	0	1	0	0	00 2D
0	1	1	1	0	1	0	0	00 2E
1	1	1	1	0	1	0	0	00 2F
0	0	0	0	1	1	0	0	00 30
1	0	0	0	1	1	0	0	00 31
0	1	0	0	1	1	0	0	00 32
1	1	0	0	1	1	0	0	00 33
0	0	1	0	1	1	0	0	00 34
1	0	1	0	1	1	0	0	00 35
0	1	1	0	1	1	0	0	00 36
1	1	1	0	1	1	0	0	00 37
0	0	0	1	1	1	0	0	00 38
1	0	0	1	1	1	0	0	00 39
0	1	0	1	1	1	0	0	00 3A
1	1	0	1	1	1	0	0	00 3B
0	0	1	1	1	1	0	0	00 3C
1	0	1	1	1	1	0	0	00 3D
0	1	1	1	1	1	0	0	00 3E
1	1	1	1	1	1	0	0	00 3F

0: OFF (open) 1: ON (short)

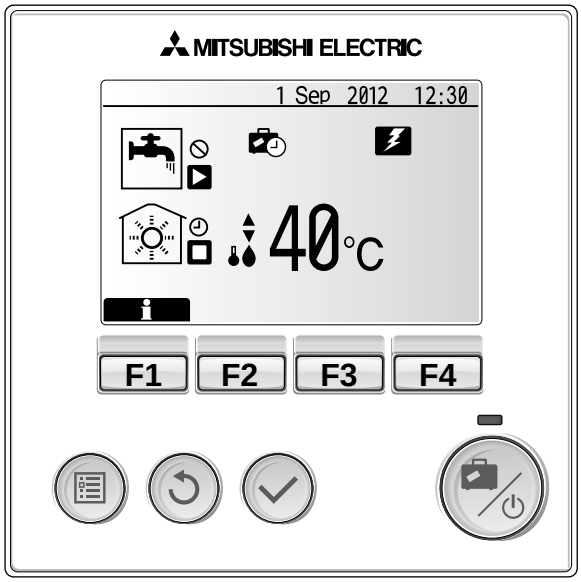
IN								Display
1	2	3	4	5	6	7	8	
0	0	0	0	0	0	1	0	00 40
1	0	0	0	0	0	1	0	00 41
0	1	0	0	0	0	1	0	00 42
1	1	0	0	0	0	1	0	00 43
0	0	1	0	0	0	1	0	00 44
1	0	1	0	0	0	1	0	00 45
0	1	1	0	0	0	1	0	00 46
1	1	1	0	0	0	1	0	00 47
0	0	0	1	0	0	1	0	00 48
1	0	0	1	0	0	1	0	00 49
0	1	0	1	0	0	1	0	00 4A
1	1	0	1	0	0	1	0	00 4B
0	0	1	1	0	0	1	0	00 4C
1	0	1	1	0	0	1	0	00 4D
0	1	1	1	0	0	1	0	00 4E
1	1	1	1	0	0	1	0	00 4F
0	0	0	0	1	0	1	0	00 50
1	0	0	0	1	0	1	0	00 51
0	1	0	0	1	0	1	0	00 52
1	1	0	0	1	0	1	0	00 53
0	0	1	0	1	0	1	0	00 54
1	0	1	0	1	0	1	0	00 55
0	1	1	0	1	0	1	0	00 56
1	1	1	0	1	0	1	0	00 57
0	0	0	1	1	0	1	0	00 58
1	0	0	1	1	0	1	0	00 59
0	1	0	1	1	0	1	0	00 5A
1	1	0	1	1	0	1	0	00 5B
0	0	1	1	1	0	1	0	00 5C
1	0	1	1	1	0	1	0	00 5D
0	1	1	1	1	0	1	0	00 5E
1	1	1	1	1	0	1	0	00 5F
0	0	0	0	0	1	1	0	00 60
1	0	0	0	0	1	1	0	00 61
0	1	0	0	0	1	1	0	00 62
1	1	0	0	0	1	1	0	00 63
0	0	1	0	0	1	1	0	00 64
1	0	1	0	0	1	1	0	00 65
0	1	1	0	0	1	1	0	00 66
1	1	1	0	0	1	1	0	00 67
0	0	0	1	0	1	1	0	00 68
1	0	0	1	0	1	1	0	00 69
0	1	0	1	0	1	1	0	00 6A
1	1	0	1	0	1	1	0	00 6B
0	0	1	1	0	1	1	0	00 6C
1	0	1	1	0	1	1	0	00 6D
0	1	1	1	0	1	1	0	00 6E
1	1	1	1	0	1	1	0	00 6F
0	0	0	0	1	1	1	0	00 70
1	0	0	0	1	1	1	0	00 71
0	1	0	0	1	1	1	0	00 72
1	1	0	0	1	1	1	0	00 73
0	0	1	0	1	1	1	0	00 74
1	0	1	0	1	1	1	0	00 75
0	1	1	0	1	1	1	0	00 76
1	1	1	0	1	1	1	0	00 77
0	0	0	1	1	1	1	0	00 78
1	0	0	1	1	1	1	0	00 79
0	1	0	1	1	1	1	0	00 7A
1	1	0	1	1	1	1	0	00 7B
0	0	1	1	1	1	1	0	00 7C
1	0	1	1	1	1	1	0	00 7D
0	1	1	1	1	1	1	0	00 7E
1	1	1	1	1	1	1	0	00 7F

<Emergency operation (Heater)>
In Emergency operation mode the outdoor heat pump unit will not operate. Heating for DHW and space heating is provided by the booster heater and the tank immersion heater (if installed). Space heating flow temp is restricted 40°C if an immersion heater is not present on the DHW tank then the booster heater will also indirectly heat the DHW.

When in Emergency operation the main control has NO control functions. It's only function is to display the Main screen and Information screen by pressing F1, all other buttons are disabled.

• Activating Emergency operation mode
To activate Emergency operation see the following:
1. Switch OFF the breaker for the outdoor unit (or both breakers if cylinder powered independently).
2. Change DIP switch SW4-5 to ON.
3. Switch ON the breaker(s).
4. Emergency Operation is now activated.

• Deactivating Emergency operation mode
To deactivate Emergency operation see the following:
1. Switch OFF the breaker for the outdoor unit (or both breakers if cylinder powered independently).
2. Change DIP switch SW4-5 to OFF.
3. Switch ON the breaker(s).
4. Emergency operation is now deactivated.

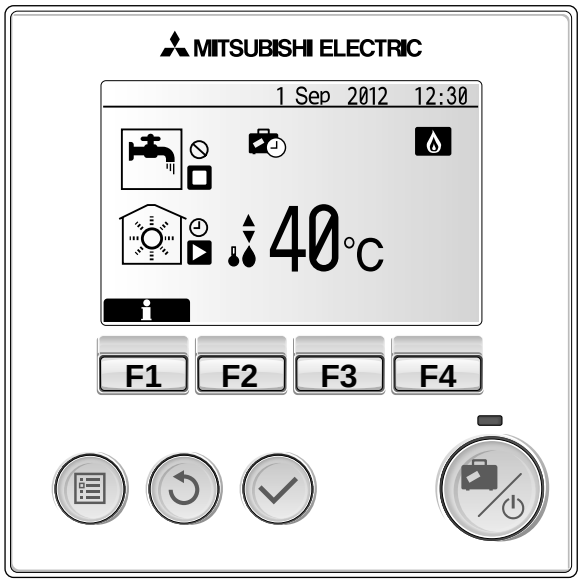


<Emergency operation (Boiler)>
In Emergency operation mode the outdoor heat pump unit will not operate. Heating for space heating is provided by the boiler.

When in Emergency operation the main control has NO control functions. It's only function is to display the Main screen and Information screen by pressing F1, all other buttons are disabled.

• Activating Emergency operation mode
To activate Emergency operation see the following:
1. Switch OFF the breaker for the outdoor unit (or both breakers if cylinder powered independently).
2. Change DIP switch SW4-6 to ON.
3. Switch ON the breaker(s).
4. Emergency Operation is now activated.

• Deactivating Emergency operation mode
To deactivate Emergency operation see the following:
1. Switch OFF the breaker for the outdoor unit (or both breakers if cylinder powered independently).
2. Change DIP switch SW4-6 to OFF.
3. Switch ON the breaker(s).
4. Emergency operation is now deactivated.



⚠ WARNING
Do not attempt to change the DIP switches whilst the breaker(s) are ON as this could result in ELECTROCUTION.

10 TROUBLESHOOTING

10-1. Troubleshooting

<Summary of self diagnosis based on Error Codes and Service Procedures>

Present and past Error codes are logged and displayed on the main controller or control board of the outdoor unit.
Please refer to the table below and subsequent explanations to diagnose and remedy typical problems that may occur in the field.

Unit Condition	Error Code	Action
Reoccurring problem	Displayed	Use table 10-4. "Self diagnosis and action" to identify fault and correct.
	Not Displayed	Use table 10-5. "Troubleshooting by inferior phenomena" to identify fault and correct.
Non reoccurring problem	Logged	1. Check temporary causes of defects such as the operation of safety devices on the refrigerant/water circuit including compressor, poor wiring, electrical noise etc. Re-check the symptom and the installation environment, refrigerant amount (Split systems only), weather conditions at time of fault etc. 2. Reset Error code logs, Service the unit and restart system.
	Not Logged	1. Recheck the abnormal symptom
		2. Identify cause of problem and take corrective action according to Table 10-5. "Troubleshooting by inferior phenomena"
		3. If no obvious problem can be found continue to operate the unit.

NOTE

Electrical components should only be replaced as a final option. Please follow instructions in Tables 10-4. and 10-5. Error Codes and Inferior Phenomena fully before resorting to replacing parts.

10-2. Test Run

Before a test run

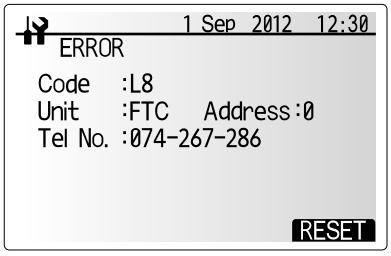
- After installation of outdoor unit, pipework and electrical wiring, recheck that there is no water leakage, loosened connections or miswiring.
- Measure impedance between the ground and the power supply terminal block (L,N) on the outdoor and indoor units with suitable (500V) ohmmeter. Resistance should be ≥ 1.0MΩ .
- Read the Installation and Operation Manuals fully especially the safety requirements before carrying out any test runs.

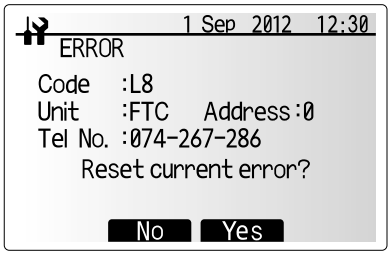
10-3. Malfunction diagnosis method by main controller

If during start up or operation a malfunction occurs the error code screen may be displayed on the main controller.
The error code screen shows the following; code, unit, ref. address, and telephone number of installer (only if previously entered by the installer)
Please not in the case of some malfunctions an error code is not generated please refer to table 10-5. for more details.

To reset

1. To reset the main controller press F4 button (Reset).
2. Then press F3 (Yes) to confirm.





10-4. Self diagnosis and action

Check if Dip SW is set correctly. (Refer to Chapter 6-11.)

Error code	Title and display conditions	Possible Cause	Diagnosis and action
L3	**Circulation water temperature overheat protection** <DHW/Heating/Cooling/LP/FS/OS> Error code displayed when THW1 detects a temp. ≥ 80ºC for 10 consecutive seconds or THW2 detects a temp. ≥ 80ºC for 10 consecutive seconds. DHW : Domestic hot water mode Heating : Heating mode Cooling : Cooling mode LP : Legionella prevention mode FS : Freeze stat OS : Operation stop TH1A/B : Room temp. thermistor TH2 : Liquid refrigerant temp. thermistor THW1 : Flow water temp. thermistor THW2 : Return water temp. thermistor THW5 : Tank water temp. thermistor THW6 : Zone 1 flow water temperature thermistor THW7 : Zone 1 return water temperature thermistor THW8 : Zone 2 flow water temperature thermistor THW9 : Zone 2 return water temperature thermistor THWB1 : Boiler flow water temperature thermistor THWB2 : Boiler return water temperature thermistor	1. Insufficient system head 2. Reduced flow in primary water circuit Due to 1 or more of the following; Faulty pump, insufficient air purge, blockedstrainer, leak in water circuit. 3. Valve operation fault 4. 2-way valve (field supply) actuator fault 5. 3-way valve actuator fault 6. Booster heater relay (BHC1, BHC2, BHCP) operating fault 7. Power supply voltage increase 8. THW1 or THW5 has become detached from its holder. 9. THW1 or THW2 fault 10. FTC4 board failure	1. Refer to table in section 10-6. to determine if system pump meets requirements. If more head required either add an pump of the same size or replace existing pump with capacity model. See 11. DISASSEMBLY PROCEDURE for how to replace pump. 2. Check circulation pump (See 10-6. for how to check). Open purge valve to remove trapped air. Check the strainer for blockages. Check the primary water circuit for leaks. Check that the flow amount is within the recommended range. 3. Check valves on primary water circuit are installed level. 4. Electrically test to determine fault. 5. 1) Electrically test to determine fault. 2) Operate 3-way valve manually using the main remote controller. (Refer to <Manual operation> in 9.2). 3) Replace 3-way valve coil. 4) Replace 3-way valve. (Refer to Procedure 6 in “11. DISASSEMBLY PROCEDURE.” 6. Electrically test the relays (BHC1, BHC2, BHCP) to determine fault. See 10-6. for how to check. 7. Check the supply voltage. 8. Visually inspect location and reattach as necessary. 9. Check resistance of thermistor against table in section 10-6. Compare FTC4 detected temperature to hand held detector. 10. Replace board.
L4	**Tank water temperature overheat protection** <DHW/Heating/Cooling/LP/FS/OS> Error code display when THW5 detects a temp. ≥ 75ºC for 10 consecutive seconds.	1. 3-way valve actuator fault 2. Immersion heater relay (IHC) operating fault 3. THW5 fault 4. FTC4 board failure	1. 1) Electrically test to determine fault. 2) Operate 3-way valve manually using the main remote controller. (Refer to <Manual operation> in 9.2). 3) Replace 3-way valve coil. 4) Replace 3-way valve. (Refer to Procedure 6 in “11. DISASSEMBLY PROCEDURE.” 2. Check immersion heater relay (IHC) 3. Check resistance of thermistor against table in section 10-6. Compare FTC4 detected temperature to hand held detector. 4. Replace board.

Error code	Title and display conditions	Possible Cause	Diagnosis and action
P1/P2/L5/LD	**Indoor unit temperature thermistor failure** * The thermistors subject to failure can be checked in "Request code: 567" in "Running information <DHW/Heating/Cooling/LP/FS/OS> Error code displayed when thermistor is at open or short (see table). Exceptions Error code will not be displayed for TH2; During defrost and for 10 mins after defrost operation.	1. Connector/terminal wire has become detached or loose wiring. 2. Thermistor fault 3. FTC4 board failure 4. The thermistor on the wireless remote controller or the main remote controller may be defective. (when Room temp. is chosen for the Heating operation and when Main Controller or Room RC 1-8 is chosen for the Room Sensor setting in the Initial setting) 5. Incorrect setting of the Dip switch(es)	1. Visually check the terminals and connections and reattachas appropriate. 2. Check resistance of thermistor against table in section 10-6. Compare FTC4 detected temperature to hand held detector. 3. Replace board. 4. Replace wireless remote controller or main remote controller 5. Check the Dip switch setting(s).
L6	**Circulation water freeze protection <DHW/Heating/Cooling/LP/FS/OS>** Error code displayed when THW1 detects a temp. ≤ 1ºC for 10 consecutive seconds or THW2 detects a temp. ≤ 3ºC for 10 consecutive seconds. Exception Error code will not be displayed if; FS function is disabled, For 10 mins after water circulation pump1 is switched on.	1. Insufficient system head 2. Reduced flow in primary water circuit. Due to 1 or more of the following; Faulty pump, insufficient air purge, blockedstrainer, leak in water circuit. 3. Valve operation fault 4. 2-way valve (field supply) actuator fault 5. 3-way valve actuator fault 6. THW1 has become detached from its holder. 7. THW1 or THW2 fault 8. FTC4 board failure	1. Refer to table in section 10-6. to determine if system pump meets requirements. If more head required either add an pump of the same size or replace existing pump with capacity model. See 11. DISASSEMBLY PROCEDURE for how to replace pump. 2. Check circulation pump (See 10-6. for how to check). Open purge valve to remove trapped air. Check the strainer for blockages. Check the primary water circuit for leaks. Check that the flow amount is within the recommended range. 3. Check valves on primary water circuit are installed level. 4. Electrically test to determine fault. 5. 1) Electrically test to determine fault. 2) Operate 3-way valve manually using the main remote controller. (Refer to <Manual operation> in 9.2). 3) Replace 3-way valve coil. 4) Replace 3-way valve. (Refer to Procedure 6 in "11. DISASSEMBLY PROCEDURE." 6. Visually inspect location and reattach as necessary. 7. Check resistance of thermistor against table in section 10-6. Compare FTC4 detected temperature to hand held detector. 8. Replace board.

Error code	Thermistor		Open detection	Short detection
	Symbol	Name		
P1	TH1A/TH1B	Room temperature thermistor	-39ºC or below	88.5ºC or above
P2	TH2	Liquid temperature thermistor	-39ºC or below	88.5ºC or above
L5	THW1	Flow water temperature thermistor	-39ºC or below	88.5ºC or above
	THW2	Return water temperature thermistor	-39ºC or below	88.5ºC or above
	THW5	Tank water temperature thermistor	-39ºC or below	88.5ºC or above
	THW6	Zone 1 flow water temperature thermistor	-39ºC or below	88.5ºC or above
	THW7	Zone 1 return water temperature thermistor	-39ºC or below	88.5ºC or above
	THW8	Zone 2 flow water temperature thermistor	-39ºC or below	88.5ºC or above
	THW9	Zone 2 return water temperature thermistor	-39ºC or below	88.5ºC or above
LD	THWB1	Boiler flow water temperature thermistor	-40ºC or below	140ºC or above
	THWB2	Boiler return water temperature thermistor	-40ºC or below	140ºC or above

Error code	Title and display conditions	Possible Cause	Diagnosis and action
L8	**Heating operation error** * "3" is displayed in "Request code: 567" in "Running information". <Heating/FS> If a), b) and c) occur, L8 is displayed; a) No change on THW1 and THW5 (under 1 °C for 20 minutes from unit starts operation) b) No change on THW1 (under 1 °C for 10 minutes from booster heater starts operation) c) THW1 - THW2 < -5 °C (for 10 minutes continuously)	1. THW1 has become detached from its holder. 2. Booster heater fault 3. THW1 or THW2 or THW5 fault 4. FTC4 board failure	1. Visually inspect location and reattach as necessary. 2. Electrically test to determine fault. See 10-6. for how to check. 3. Check resistance of thermistor against table in section 10-6. Compare FTC4 detected temperature to hand held detector. 4. Replace board.
	Heating operation error * "A" is displayed in "Request code: 567" in "Running information".	1. THW6 has become detached from its holder. 2. THW6 or THW7 fault 3. FTC4 board failure	1. Visually inspect location and reattach as necessary. 2. Check resistance of thermistor against table in section 10-6. Compare FTC4 detected temperature to hand held detector. 3. Replace board.
	Heating operation error * "C" is displayed in "Request code: 567" in "Running information".	1. THW8 has become detached from its holder. 2. THW8 or THW9 fault 3. FTC4 board failure	1. Visually inspect location and reattach as necessary. 2. Check resistance of thermistor against table in section 10-6. Compare FTC4 detected temperature to hand held detector. 3. Replace board.
L9	**Low primary circuit (Heat source side) flow rate detected by flow switch** * "1" is displayed in "Request code: 569" in "Running information". <DHW/Heating/Cooling/LP/FS> Error code displayed when flow switch detects low flow rate for 10 seconds. <u>Exception</u> For 1 min after water circulation pump1 is switched on.	1. Insufficient system head 2. Reduced flow in primary water circuit Due to 1 or more of the following; Faulty pump, insufficient air purge, blocked strainer, leak in water circuit. 3. Valve operation fault 4. 2-way valve (field supply) actuator fault 5. Connector/terminal wire has become detached or loose wiring. 6. Flow switch fault 7. Incorrect setting of the SW2-2 8. FTC4 board failure	1. Refer to table in section 10-6. to determine if system pump meets requirements. If more head required either add an pump of the same size or replace existing pump with capacity model. See 11. DISASSEMBLY PROCEDURE for how to replace pump. 2. Check circulation pump (See 10-6. for how to check). Open purge valve to remove trapped air. Check the strainer for blockages. Check the primary water circuit for leaks. Check that the flow amount is within the recommended range. 3. Check valves on primary water circuit are installed level. 4. Electrically test to determine fault. 5. Visually check the CN2F connector and IN2 terminal and reattach if necessary. 6. Electrically test to determine fault. See 10-6. for how to check. 7. Check the SW2-2 setting. 8. Replace board.
	Low primary circuit (Zone1 side) flow rate detected by flow switch * "2" is displayed in "Request code: 569" in "Running information".	1. Insufficient system head 2. Reduced flow in primary water circuit Due to 1 or more of the following; Faulty pump, insufficient air purge, blocked strainer, leak in water circuit. 3. Terminal wire has become detached or loose wiring. 4. Flow switch fault 5. Incorrect setting of the SW3-2 6. FTC4 board failure	1. If more head required either add an pump of the same size or replace existing pump. 2. Check circulation pump (See 10-6. for how to check). Open purge valve to remove trapped air. Check the strainer for blockages. Check the primary water circuit for leaks. Check that the flow amount is within the recommended range. 3. Visually check the IN3 terminal and reattach if necessary. 4. Electrically test to determine fault. 5. Check the SW3-2 setting. 6. Replace board.

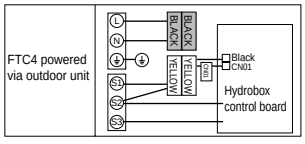
Error code	Title and display conditions	Possible Cause	Diagnosis and action
L9	**Low primary circuit (Zone2 side) flow rate detected by flow switch** * "3" is displayed in "Request code: 569" in "Running information".	1. Insufficient system head	1. If more head required either add an pump of the same size or replace existing pump.
		2. Reduced flow in primary water circuit Due to 1 or more of the following; Faulty pump, insufficient air purge, blocked strainer, leak in water circuit.	2. Check circulation pump (See 10-6. for how to check). Open purge valve to remove trapped air. Check the strainer for blockages. Check the primary water circuit for leaks. Check that the flow amount is within the recommended range.
		3. Terminal wire has become detached or loose wiring.	3. Visually check the IN7 terminal and reattach if necessary.
		4. Flow switch fault	4. Electrically test to determine fault.
		5. Incorrect setting of the SW3-3	5. Check the SW3-3 setting.
		6. FTC4 board failure	6. Replace board.
LC	Boiler circulation water temperature overheat protection <DHW/Heating/LP/FS/OS> Error code displayed when THWB1 detects a temp. ≥80ºC for 10 consecutive seconds or THWB2 detects a temp. ≥80ºC for 10 consecutive seconds	1. The set temperature for Boiler is too high.	1. Check if the set temperature for Boiler for heating exceeds the restriction. (See the manual for the thermistors "PAC-TH011HT-E")
		2. Flow rate of the heating circuit from the boiler may be reduced.	2. Check for • water leakage • strainer blockage • water circulation pump function.
LD	Boiler temperature thermistor (THWB1, THWB2) failure	Refer to error codes (P1/P2/L5/LD).	
LE	Boiler operation error <Heating> Boiler is running and THW6 detects a temperature <30ºC for consecutive 60 minutes.	1. THW6 has become detached from its holder.	1. Visually inspect location and reattach as necessary.
		2. Incorrect wiring between FTC4 (OUT10) and the boiler.	2. See the manual of the thermistors "PAC-TH011HT-E".
		3. Boiler fuel has run out or the system is OFF.	3. Check the status of the boiler.
		4. Boiler failure	4. Check the status of the boiler.
		5. FTC4 board failure	5. Replace board.
LH	Boiler circulation water freeze protection	Flow rate of the heating circuit from the boiler may be reduced.	Check for • water leakage • strainer blockage • water circulation pump function.
LL	Setting errors of Dip switches on FTC4 control board	Incorrect setting of Dip switches.	
		1. Boiler operation	1. For boiler operation, check that Dip SW1-1 is set to ON (With Boiler) and Dip SW2-6 is set to ON (With Mixing Tank).
		2. 2-zone temperature control	2. For 2-zone temperature control, check Dip SW2-7 is set to ON (2-zone) and Dip SW2-6 is set to ON (With Mixing Tank).
		3. Multiple outdoor units control	3. For multiple outdoor units control, check Dip SW1-3 is set to ON on FTC (slave) that runs DHW operation .
P1	Indoor unit temperature thermistor (TH1A/TH1B) failure	Refer to error codes (P1/P2/L5/LD).	
P2	Indoor unit temperature thermistor (TH2) failure	Refer to error codes (P1/P2/L5/LD).	
P6	Anti-freeze protection of plate heat exchanger <Cooling> The error code displayed when Ref. liquid temp. (TH2) stays at -5ºC or lower for 10 seconds after compressor operates for 6 minutes.	<Cooling>	
		1. Reduced water flow • Clogged filter • Leakage of water	1., 2. Check water piping.
		2. Low temperature • Low load • Inlet water is too cold.	
		3. Defective water pump	3. Check water pump.
		4. Defective outdoor fan control.	4. Check outdoor fan motor.
		5. Overcharge of refrigerant	5., 6. Check operating condition of refrigerant circuit.
		6. Defective refrigerant circuit (clogs)	
		7. Malfunction of linear expansion valve	7. Check linear expansion valve.

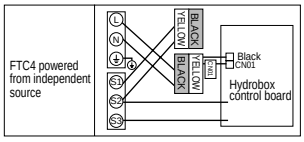
Error code	Title and display conditions	Possible Cause	Diagnosis and action
P6	<Defrosting> THW2 detects a temperature ≤15ºC and TH2 detects a temperature ≤−16ºC for consecutive 10 seconds.	<Defrosting> 1. Reduced water flow • Clogged filter • Leakage of water 2. Low temperature • Low load • Inlet water is cold 3. Defective water pump 4. Leakage or shortage of refrigerant 5. Malfunction of linear expansion valve	 1., 2. Check water piping. 3. Check water pump. 4. Correct to proper amount of refrigerant. 5. Check linear expansion valve.
E0/E4	**Main controller communication failure (Reception error)** Error code E0 is displayed if main controller does not receive any signal from the indoor unit for ref. address "0" for 3 mins. Error code E4 is displayed if indoor unit does not receive any data from the main controller for 3 mins or indoor unit does not receive any signal from the main controller for 2 mins.	1. Contact failure with transmission cable 2. Wiring procedure not observed. (Cable length/cable diameter/number of indoor units/number of main controllers) 3. Fault on the indoor unit FTC4 board section controlling Ref. address "0" 4. Fault with the main controller circuit board 5. Electrical noise causes interference with transmission/reception of data for main controller.	1. Check connection cable for damage or loose connections at the FTC4 and main controller terminals. 2. Check main controller and FTC4 common wiring max cable length 500 m. Only use 2 core cable. Only connect 1 main controller to 1 FTC4 indoor unit board. 3. to 5. If the problem is not solved by the above measures then: Turn the power to the indoor unit OFF and then ON. Power to both the indoor unit and outdoor units should be switched OFF then ON. (This may require switching 1 or 2 breakers depending if the unit is powered independently from the outdoor unit). If the E4 code is still displayed the FTC4 and/or the main controller circuit board
E3/E5	**Main controller communication failure (Transmission error)** Error code E3 is displayed if the main controller an not find an empty transmission path and thus fails to transmit for 6 secs or the data received bythe main controller is different to what was sent (by the main controller) 30 consecutive times. Error code E5 is displayed if the FTC4 can not find an empty transmission path for 3 mins and thus cannot transmit or the data sent by the FTC4 is different to what was expected 30 consecutive times.	1. 2 or more main controllers have been connected to the FTC4. 2. Fault with main controller transmission/ receiving circuit board 3. Fault with the main controller circuit board 4. Electrical noise causes interference with transmission/reception of data for main controller.	1. Only connect 1 main controller to 1 FTC4 indoor unit board. 2. to 4. Turn the power to the indoor unit OFF and then ON. Power to both the indoor unit and outdoor units should be switched OFF then ON. (This may require switching 1 or 2 breakers depending if the unit is powered independently from the outdoor unit). If the E3/E5 code is still displayed the FTC4 and/or the main controller circuit board
E6	**Indoor/outdoor communication failure (Reception error)** Error code E6 is displayed if after the power is switched ON to the indoor unit, the FTC4 board does not receive any signal or the signal receive-dis not complete for 6 mins, or after a period of operation the FTC4 board does not receive any signal or the signal received is not complete for 3 mins.	1. Contact failure/short circuit/miswiring 2. Fault with outdoor unit transmission/ receiving circuit board 3. Fault with FTC4 transmission/receiving circuit board 4. Electrical noise causes interference with FTC4-Outdoor unit transmission cable.	* Check the LED display on the outdoor unit circuit board. (Connect the A-control service tool, PAC-SK52ST to test.) Refer to the outdoor unit service manual for explanation of EA-EC codes. 1. Check the connections on the indoor and outdoor units have not become loose and that the connecting cable is not damaged. 2. to 4. Turn the power to the indoor unit OFF and then ON. Power to both the indoor unit and outdoor units should be switched OFF then ON. (This may require switching 1 or 2 breakers depending if the unit is powered independently from the outdoor unit). If the E6 code is still displayed the FTC4 and/or the outdoor unit circuit board should be replaced.
E7	**Indoor/outdoor communication failure (Transmission error)** Error code E7 is displayed if despite the FTC4 board sending signal "0", signal "1" is received 30 consecutive times.	1. Fault with FTC4 transmission/receiving circuit board 2. Electrical noise causes interference with power supply. 3. Electrical noise causes interference with FTC4-outdoor unit transmission cable.	1. to 3. Turn the power to the indoor unit OFF and then ON. Power to both the indoor unit and outdoor units should be switched OFF then ON. (This may require switching 1 or 2 breakers depending if the unit is powered independently from the outdoor unit). If the E7 code is still displayed the FTC4 circuit board should be replaced.

Error code	Title and display conditions	Possible Cause	Diagnosis and action
E1/E2	**Main controller control board failure** Error code E1 displayed if main controller can not access it's non volatile (non power dependent) memory. Error code E2 is displayed when there is a fault with the main controller's internal clock.	1. Fault with the main controller circuit board	1. Replace main controller circuit board.
J0	**Indoor unit/wireless receiver communication failure** Error code J0 is displayed when the FTC4 can not receive data from the wireless receiver for 1 min.	1. Connection fault with wireless receiver-FTC4 connection 2. Fault with FTC4 receiving circuit board 3. Fault with wireless receiver's transmission circuit board 4. Electrical noise causes interference with wireless receiver communication cable.	1. Check the connections to the wireless receiver and FTC4 have not become loose and that the connecting cable is not damaged. 2. to 4. Turn the power to the indoor unit OFF and then ON. Power to both the indoor unit and outdoor units should be switched OFF then ON. (This may require switching 1 or 2 breakers depending if the unit is powered independently from the outdoor unit). If the J0 code is still displayed the FTC4 and/or the wireless receiver circuit board should be replaced.
J1 to J8	**Wireless remote controller/wireless receiver communication failure** **(Reception error)** Error code displayed if wireless receiver receives no/incomplete data from the wireless remote controller for 15 consecutive minutes. The digit after the J refers to the address of the wireless remote controller that has the error. E.g. Error code "J3" refers to a communication fault between the wireless receiver and wireless remote control with address 3.	1. Battery on wireless remote control may be flat 2. The wireless remote controller is out of range of the wireless receiver. 3. Fault with wireless remote controller transmission circuit board 4. Fault with wireless receiver's reception circuit board	1. Check and replace the battery if necessary the wireless remote controller battery. 2. to 4. Reposition the wireless remote control closer to the receiver and perform a communication test. For procedure refer to wireless remote controller installation manual. If "OK" is displayed then the cause of the J1 to J8 error was the controller was out of range of the receiver. The wireless remote controller should be installed within range of the receiver. If "Err" is displayed replace wireless remote controller with a new controller and perform the pairing procedure. If after this procedure the "Err" code is still displayed the fault is with the receiver unit (attached to the indoor unit). The receiver unit should be replaced with a new part and the original remote control can be reconnected. If "OK" is displayed then the fault is with the remote control and this should be replaced.
J9	Main controller communication failure Error code J9 is displayed when signal is not received normally from FTC4 (slave) for 3 mins.	Refer to error codes (E0 and E4)	

Note: To cancel error codes please switch system off (press button F4 (RESET) on main controller).

10-5. Troubleshooting by inferior phenomena

No.	Fault symptom	Possible cause	Explanation - Solution
1	Main controller display is blank.	1. There is no power supply to main controller.	1. Check LED2 on FTC4. (See <Figure 5.2.1 in installation manual>.) (i) When LED2 is lit. Check for damage or contact failure of the main controller wiring. (ii) When LED2 is blinking. Refer to No. 5 below. (iii) When LED2 is not lit. Refer to No. 4 below.
		2. Power is supplied to main controller, however, the display on the main controller does not appear.	2. Check the following: • Disconnection between the main controller cable and the FTC4 control board • Failure of the main controller if “Please Wait” is not displayed. • Refer to No. 2 below if “Please Wait” is displayed.
2	“Please Wait” remains displayed on the main controller.	1. "Please Wait" is displayed for up to 6 minutes. 2. Communication failure between the main controller and FTC4. 3. Communication failure between FTC4 and outdoor unit.	1. Normal operation. 2, 3. Main controller start up checks/procedure. (i) If “0%” or “50-99%” is displayed below "Please Wait" there is a communication error between the main controller and the FTC4 control board. • Check wiring connections on the main controller. • Replace the main controller or the FTC4 control board. (ii) If “1-49%” is displayed there is a communication error between the outdoor unit's and FTC4's control boards. • Check the wiring connections on the outdoor unit control board and the FTC4 control board. (Ensure S1 and S2 are not cross-wired and S3 is securely wired with no damage. (See section 4.5. in installation manual) • Replace the outdoor unit's and/or the FTC4's control boards.
3	The main screen appears with a press of the “ON” button, but disappears in a second.	The main controller operations do not work for a while after the settings are changed in the service menu. This is because the system takes time to apply the changes.	Normal operation. The indoor unit is applying updated settings made in the service menu. Normal operation will start shortly.
4	LED2 on FTC4 is off. (See <Figure 5.2.1 in installation manual>.)	When LED1 on FTC4 is also off. (See <Figure 5.2.1 in installation manual>.) <FTC4 powered via outdoor unit.>	
		1. The outdoor unit is not supplied at the rated voltage.	1. Check the voltage across the terminals L and N or L3 and N on the outdoor power board. (See section 4.5. in installation manual) • When the voltage is not 220 to 240V AC, check wiring of the outdoor unit and of the breaker. • When the voltage is at 220 to 240V AC, go to “2.” below.
		2. Defective outdoor controller circuit board.	2. Check the voltage across the outdoor unit terminals S1 and S2. (See section 4.5. in installation manual) • When the voltage is not 220 to 240V AC, check the fuse on the outdoor control board and check for faulty wiring. • When the voltage is 220 to 240V AC, go to “3.” below.
		3. FTC4 is not supplied with 220 to 240V AC.	3. Check the voltage across the indoor unit terminals S1 and S2. (See section 4.5.) • When the voltage is not 220 to 240V AC, check FTC4-outdoor unit wiring for faults. • When the voltage is 220 to 240V AC, go to “4.” below.
		4. FTC4 failure.	4. Check the FTC4 control board. • Check the fuse on FTC4 control board. • Check for faulty wiring. • If no problem found with the wiring, the FTC4 control board is faulty.
		5. Faulty connector wiring.	5. Check the connector wiring. • When the connectors are wired incorrectly, re-wire the connectors referring to below. (See section 4.5. in installation manual) 

No.	Fault symptom	Possible cause	Explanation - Solution
4	LED2 on FTC4 is off. (See Figure <5.2.1 in installation manual>)	<FTC4 powered on independent source> 1. FTC4 is not supplied with 220 to 240V AC.	1. Check the voltage across the L and N terminals on the indoor power supply terminal block. (See section 4.5. in installation manual) • When the voltage is not 220 to 240V AC, check for faulty wiring to power supply. • When the voltage is 220 to 240V AC, go to 2. below.
		2. There are problems in the method of connecting the connectors.	2. Check for faulty wiring between the connectors. • When the connectors are wired incorrectly re-wire them correctly referring to below. (See section 4.5 in installation manual and a wiring diagram on the control and electrical box cover.)  • If no problem found with the wiring, go to 3. below.
		3. FTC4 failure.	3. Check the FTC4 control board. • Check the fuse on FTC4 control board. • Check for faulty wiring. • If no problem found with the wiring, the FTC4 control board is faulty.
		When LED1 on FTC4 is lit. Incorrect setting of refrigerant address for outdoor unit. (None of the refrigerant address is set to "0".)	Recheck the refrigerant address setting on the outdoor unit. Set the refrigerant address to “0”. (Set refrigerant address using SW1(3 - 6) on outdoor controller circuit board.)
5	LED2 on FTC4 is blinking. (See Figure <5.2.1 in installation manual>)	When LED1 is also blinking on FTC4 . Faulty wiring between FTC4 and outdoor unit	Check for faulty wiring between FTC4 and outdoor unit.
		When LED1 on FTC4 is lit. 1. Faulty wiring in main controller Multiple indoor units have been wired to a single outdoor unit. 2. Short-circuited wiring in main controller 3. Main controller failure	1. Check for faulty wiring in main controller. The number of indoor units that can be wired to a single outdoor unit is one. Additional indoor units must be wired individually to a single outdoor unit. 2.,3. Remove main controller wires and check LED2 on FTC4. (See Figure 5.2.1. in installation manual) • If LED2 is blinking check for short circuits in the main controller wiring . • If LED2 is lit, wire the main controller again and: - if LED2 is blinking, the main controller is faulty; - if LED2 is lit, faulty wiring of the main controller has been corrected.
6	LED4 on FTC4 is off. (See figure <5.2.1> in installation manual)	1. SD memory card is NOT inserted into the memory card slot with correct orientation. 2. Not an SD standards compliant memory card.	1. Correctly insert SD memory card in place until a click is heard. 2. Use an SD standards compliant memory card. (Refer to section 5.6. in installation manual)
	LED4 on FTC4 is blinking. (See Figure <5.2.1> in installation manual)	1. Full of data. 2. Write-protected. 3. NOT formatted. 4. Formatted in NTFS file system.	1. Move or delete data, or replace SD memory card with a new one. 2. Release the write-protect switch. 3. Refer to "5.6 Using SD memory card" in installation manual. 4. FTC4 is Not compatible with NTFS file system. Use an SD memory card formatted in FAT file system.
7	No water at hot tap.	1. Cold main off 2. Strainer (field supply) blocked.	1. Check and open stop cock. 2. Isolate water supply and clean strainer.
8	Cold water at tap.	1. Hot water run out. 2. Prohibit, schedule timer or holiday mode selected. 3. Heat pump not working. 4. Booster heater cut-out tripped. 5. The earth leakage circuit breaker for booster heater breaker (ECB1) tripped. 6. The booster heater thermal cut-out has tripped and cannot be reset using the manual reset button. 7. Immersion heater cut-out tripped. 8. Immersion heater breaker (ECB2) tripped. 9. 3-way valve fault	1. Ensure DHW mode is operating and wait for DHW tank to re-heat. 2. Check settings and change as appropriate. 3. Check heat pump – consult outdoor unit service manual. 4. Check booster heater thermostat and press reset button if safe. Reset button is located on the side of booster heater, covered with white rubber cap. See 4. PART NAMES AND FUNCTIONS to find out its position. 5. Check the cause and reset if safe. 6. Check resistance across the thermal cut-out, if open then the connection is broken and the booster heater will have to be replaced. Contact your Mitsubishi Electric dealer. 7. Check immersion heater thermostat and press reset button, located on immersion heater boss, if safe. If the heater has been operated with no water inside it may have failed, so please replace it with a new one. 8. Check the cause and reset if safe. 9. Check plumbing/wiring to 3-way valve. (i) Manually override 3-way valve using the main controller. (Refer to <Manual operation> in section 9-2.) If the valve does not still function, go to (ii) below. (ii) Replace 3-way valve.

No.	Fault symptom	Possible cause	Explanation - Solution
9	Water heating takes longer.	1. Heat pump not working. 2. Booster heater cut-out tripped. 3. Booster heater breaker (ECB1) tripped. 4. The booster heater thermal cut-out has tripped and cannot be reset using the manual reset button. 5. Immersion heater cut-out has been triggered. 6. Immersion heater breaker (ECB2) tripped.	1. Check heat pump – consult outdoor unit service manual. 2. Check booster heater thermostat and press reset button if safe. Reset button is located on the side of booster heater, covered with white rubber cap. See 4. PART NAMES AND FUNCTIONS to find out its position. 3. Check the cause and reset if safe. 4. Check resistance across the thermal cut-out, if open then connection is broken and the booster heater will have to be replaced. Contact your Mitsubishi Electric dealer. 5. Check immersion heater thermostat and press reset button if safe. If the heater kept running with no water inside, this may have resulted in failure, so replace it with a new one. 6. Check the cause and reset if safe.
10	Temperature of DHW tank water dropped.	When DHW operation is not running, the DHW tank emits heat and the water temperature decreases to a certain level. If water in the DHW tank is reheated frequently because of a significant drop in water temperature, check for the following. 1. Water leakage in the pipes that connect to the DHW tank 2. Insulation material coming loose or off. 3. 3-way valve failure	1. Take the following measures. • Retighten the nuts holding the pipes onto the DHW tank. • Replace seal materials. • Replace the pipes. 2. Fix insulation. 3. Check plumbing/wiring to 3-way valve. (i) Manually override 3-way valve using the main controller. (Refer to <Manual operation> in section 9-2.) If the valve does not still function, go to (ii) below. (ii) Replace 3-way valve.
11	Hot or warm water from cold tap.	Heat of hot water pipe is transferred to cold water pipe.	Insulate/re-route pipework.
12	Water leakage	1. Poorly sealed connections of water circuit components 2. Water circuit components reaching the end of life	1. Tighten connections as required. 2. Refer to PARTS CATALOG in the service manual for expected part lifetimes and replace them as necessary.
13	Heating system does not reach the set temperature.	1. Prohibit, schedule timer or holiday mode selected. 2. Check settings and change as appropriate. 3. The temperature sensor is located in a room that has a different temperature relative to that of the rest of the house. 4. Heat pump not working. 5. Booster heater cut-out tripped. 6. Booster heater breaker (ECB1) tripped. 7. The booster heater thermal cut-out tripped and can not be reset using the manual reset button. 8. Incorrectly sized heat emitter. 9. 3-way valve failure 10. Battery problem (*wireless control only) 11. If a mixing tank is installed, the flow rate between the mixing tank and the hydrobox is less than that between the mixing tank and the local system.	1. Check settings and change as appropriate. 2. Check the battery power and replace if flat. 3. Relocate the temperature sensor to a more suitable room. 4. Check heat pump – consult outdoor unit service manual. 5. Check booster heater thermostat and press reset button if safe. Reset button is located on the side of booster heater, covered with white rubber cap. (See 4. PART NAMES AND FUNCTIONS for position.) 6. Check the cause of the trip and reset if safe. 7. Check resistance across the thermal cut-out, if open then the connection is broken and the booster heater will have to be replaced. Contact your Mitsubishi Electric dealer. 8. Check the heat emitter surface area is adequate Increase size if necessary. 9. Check plumbing/wiring to 3-way valve. 10. Check the battery power and replace if flat. 11. Increase the flow rate between the mixing tank and the hydrobox decrease that between the mixing tank and the local system.

No.	Fault symptom	Possible cause	Explanation - Solution
14	In 2-zone temperature control, only Zone2 does not reach the set temperature.	1. When Zone1 and Zone2 are both in heating mode, the hot water temperature in Zone2 does not exceed that in Zone1. 2. Faulty wiring of motorized mixing valve 3. Faulty installation of motorized mixing valve 4. Incorrect setting of Running time 5. Motorized mixing valve failure	1. Normal action no action necessary. 2. Refer to "5.3 Wiring for 2-zone temperature control" in installation manual. 3. Check for correct installation. (Refer to the manual included with each motorized mixing valve.) 4. Check for correct setting of Running time. 5. Inspect the mixing valve. (Refer to the manual included with each motorized mixing valve.)
15	When a PUHZ-FRP outdoor unit is connected, DHW or Heating operation cannot run.	The outdoor unit is set to have operation of the indoor unit of air conditioner take precedence over that of the hydrobox, and in the main controller settings "Electric heater (Heating)" or "Electric heater (DHW)" is turned off.	Turn ON Electric heater (Heating) or Electric heater (DHW) using the main controller.
16	When a PUHZ-FRP outdoor unit is connected and is in heat recovery operation, the set temperature is not reached.	When the outdoor unit is set to have cooling operation of the indoor unit of air conditioner take precedence over that of the hydrobox, the outdoor unit controls the frequency of the compressor according to the load of air conditioner. The DHW and heating run according to that frequency.	Normal operation no action necessary. If Air-to-Water system is given priority in operation, comp Hz can be regulated depending on the load of DHW or Heating. For more details, refer to the PUHZ-FRP installation manual.
17	After DHW operation room temperature rises slightly.	At the end of the DHW mode operation the 3-way valve diverts hot water away from the DHW circuit into space heating circuit. This is done to prevent the hydrobox components from overheating. The amount of hot water directed into the space heating circuit varies according to the type of the system and of the pipe run between the plate heat exchanger and the hydrobox.	Normal operation no action necessary.
18	The room temperature rises during DHW operation.	3-way valve failure	Check the 3-way valve.
19	Water discharges from pressure relief valve. (Primary circuit)	1. If continual – pressure relief valve may be damaged. 2. If intermittent – expansion vessel charge may have reduced/bladder perished.	1. Turn the handle on the pressure relief valve to check for foreign objects in it. If the problem is not still solved, replace the pressure relief valve with a new one. 2. Check pressure in expansion vessel. Recharge to 1 bar if necessary. If bladder perished replace expansion vessel with a new one.
20	Water discharges from pressure relief valve (field supplied item). (Sanitary circuit)	1. If continual – field supplied pressure reducing valve not working. 2. If continual – pressure relief valve seat may be damaged. 3. If intermittent – expansion vessel charge may have reduced/bladder perished. 4. DHW tank may have subjected to backflow.	1. Check function of pressure reducing valve and replace if necessary. 2. Turn the handle on the pressure relief valve to check for foreign objects inside. If the problem is not still solved, replace the pressure relief valve. 3. Check gas-side pressure in expansion vessel. Recharge to correct precharge pressure if necessary. If bladder perished replace expansion vessel with a new one with appropriate pre-charge. 4. Check the pressure in DHW tank. If pressure in DHW tank is similar to that in the incoming mains, cold water supply that merges with incoming mains water supply could flow back to DHW tank. Investigate source of back-feed and rectify error in pipework/fitting configuration. Adjust pressure in cold supply.
21	Noisy water circulation pump	Air in water circulation pump .	Use manual and automatic air vents to remove air from system. Top up water if necessary to achieve 1 bar on primary circuit.
22	Noise during hot water draw off typically worse in the morning.	1. Loose airing cupboard pipework. 2. Heaters switching on/off.	1. Install extra pipe fastening clips. 2. Normal operation no action necessary.
23	Mechanical noise heard coming from the hydrobox.	1. Heaters switching on/off. 2. 3-way valve changing position between DHW and heating mode.	Normal operation no action necessary.
24	Water circulation pump runs for a short time unexpectedly .	Water circulation pump jam prevention mechanism (routine) to inhibit the build-up of scale.	Normal operation no action necessary.
25	Milky/Cloudy water (Sanitary circuit)	Oxygenated water	Water from any pressurised system will release oxygen bubbles when water is running. The bubbles will settle out.
26	Heating mode has been on standby for a long time (does not start operation smoothly.)	The time of “Delay” set in “Economy settings for pump” is too short. (Go to “Service menu” → “Auxiliary settings” → “Economy settings for pump”).	Increase the time of “Delay” in “Economy settings for pump” .

No.	Fault symptom	Possible cause	Explanation - Solution
27	The hydrobox that was running in the heating mode before power failure is running in the DHW mode after power recovery.	The hydrobox is designed to run in an operation mode with a higher priority (i.e. DHW mode in this case) at power recovery.	• Normal operation. • After the DHW max. operation time has elapsed or the DHW max. temperature has been reached, the DHW mode switches to the other mode (ex. Heating mode).
28	Cooling mode is NOT available.	Dip SW2-4 is OFF.	Turn Dip SW2-4 to ON. (Refer to “6-9 Dip switch settings” in this manual.)
29	The cooling system does not cool down to the set temperature.	1. When the water in the circulation circuit is unduly hot, Cooling mode starts with a delay for the protection of the outdoor unit. 2. When the outdoor ambient temperature is lower than the preset temperature that activates the freeze stat. function, Cooling mode does not start running.	1. Normal operation. 2. To run Cooling mode overriding the freeze stat. function, adjust the preset temperature that activates the freeze stat. function. (Refer to "<Freeze stat function>" on Page 37.)
30	The electric heaters are activated shortly after DHW or LP mode starts running after Cooling mode.	The setting time period of Heat-pump-only operation is short.	Adjust the setting time period of Heat-pump only operation. (Refer to “<Electric heater (DHW)> on Page 36.
31	During DHW or LP mode following the cooling mode, error L6 (circulation water freeze protection error) occurs and the system stops all the operations.	The unit runs in Cooling mode when the outdoor ambient temperature is lower than 10ºC (outside of the guaranteed operating range). (When defrosting operation is running at such a low outdoor ambient temperature after Cooling mode is switched to DHW or LP mode, the water temperature in the cooling circuit drops too low, which could result in L6 error to stop all the operations.	Do not run Cooling operation when the outdoor ambient temperature is lower than 10ºC. To automatically stop or recover only Cooling operation and keep other operations running, the freeze stat. function can be used. Set the preset temperature that activates the freeze stat. function to adjust the outdoor ambient temperature as follows. (Refer to "<Freeze stat function>" on Page 37.) **Outdoor ambient temperature** / **Cooling operation** 3ºC higher than the preset temperature / Stop 5ºC higher than the preset temperature / Recover

Annual Maintenance

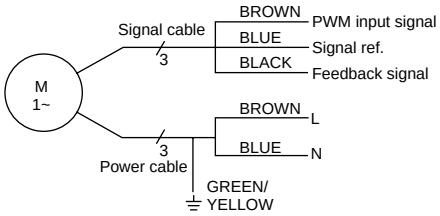
It is essential that the hydrobox is serviced at least once a year by a qualified individual any spare parts required MUST be purchased from Mitsubishi Electric (safety matter).
NEVER bypass safety devices or operate the unit without them being fully operational.

<Draining the hydrobox>
WARNING: DRAINED WATER MAY BE VERY HOT
1. Before attempting to drain the hydrobox isolate from the electrical supply to prevent booster heater burning out.
2. Isolate hydrobox from primary water circuit and drain water from hydrobox. Use a suitable heat resistant hose to assist in these operations.
3. Drain any remaining water from booster heater using fitted drain cock and hose to safely drain the unit.
4. After the hydrobox is drained, water remains in the following component parts. Drain water completely by checking the inside of the parts.
   - Strainer (Remove the strainer cover.)
   - Pressure relief valve (Operate the valve.)

<Annual maintenance points>
Use the Annual Maintenance Log Book as a guide to carrying out the necessary checks on the hydrobox and outdoor unit.

10-6. Checking Component Parts' Function

Part Name	Check Points



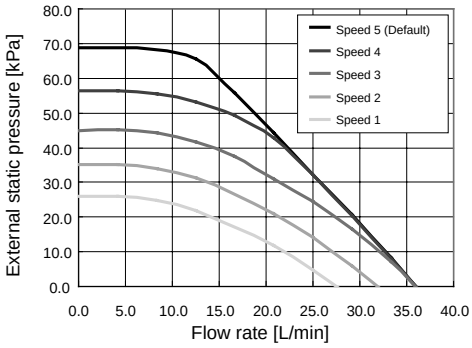
<Recommended water flow rate range>

Outdoor heat pump unit		Water flow rate range [L/min]
Packaged	PUHZ-W50	7.1 - 14.3
	PUHZ-W85	10.0 - 25.8
	PUHZ-HW112	14.4 - 27.7
	PUHZ-HW140	17.9 - 27.7
Split	PUHZ-RP35	7.1 - 11.8
	PUHZ-RP50	7.1 - 17.2
	PUHZ-RP60	8.6 - 20.1
	PUHZ-(H)RP71	10.2 - 22.9
	PUHZ-(H)RP100	14.4 - 27.7
	PUHZ-(H)RP125	17.9 - 27.7
	PUHZ-RP140	20.1 - 27.7
	PUHZ-SW40	7.1 - 11.8
	PUHZ-SW50	7.1 - 17.2
	PUHZ-SW75	10.2 - 22.9
	PUHZ-SW100	14.4 - 27.7
	PUHZ-SW120	20.1 - 27.7
	PUHZ-SHW80	10.2 - 22.9
	PUHZ-SHW112	14.4 - 27.7
	PUHZ-SHW140	17.9 - 27.7

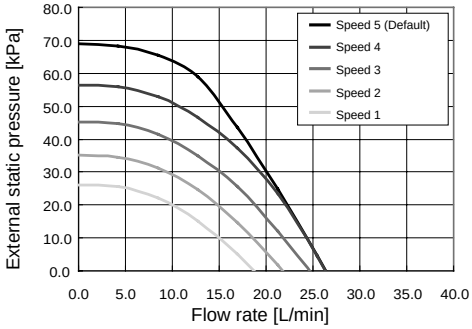
* If the water flow rate is less than 7.1 L/min, the flow switch will be activated.
  If the water flow rate exceeds 27.7 L/min, the flow speed will be greater than 1.5 m/s, which could erode the pipes.

<Water Circulation Pump Characteristics>

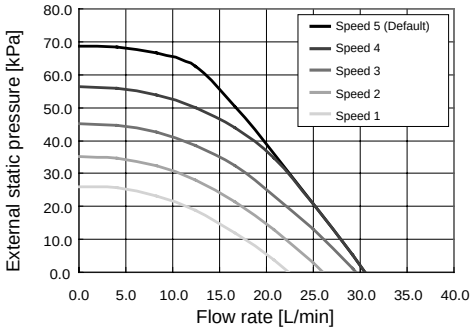
EHSC, ERSC series



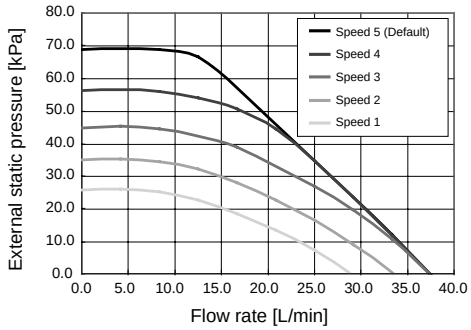
EHPX series * (with PUHZ-W50)



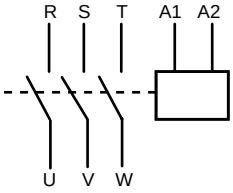
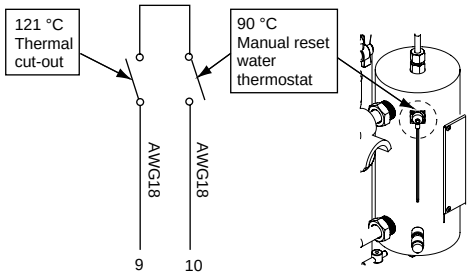
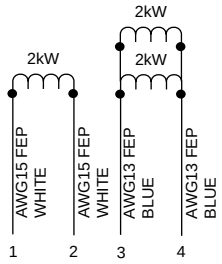
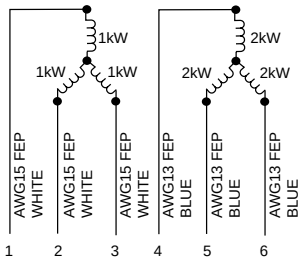
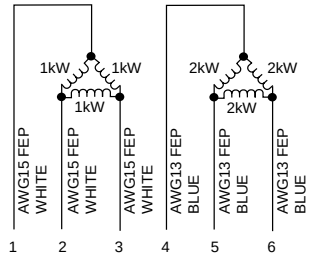
EHPX series * (with PUHZ-W85)

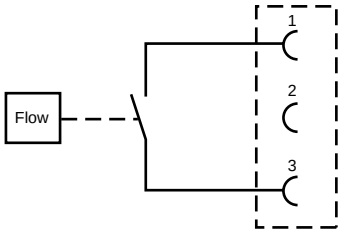


EHPX series * (with PUHZ-HW112/140)



* For installation of EHPX series, set its pump speed with a pressure drop between the hydrobox and the outdoor unit factored into the external static pressure.

Part Name	Check Points
Earth leakage circuit breaker for heater	If a short circuit occurs on the booster heater, immersion heater, or each power line, a short-circuit breaker will trip and power source will be blocked. Eliminate the causes of short circuit and then turn on the breaker again.
Relay for heater 	When the applied voltage is not 230V AC across the terminals A1-A2, check the terminals R-U, S-V, and T-W are open. When the applied voltage is 230V AC across the terminals A1-A2, check the terminals R-U, S-V, and T-W are short.
Booster heater Thermostat (90 °C) and thermal cut out (121 °C) 	Measure the resistance between the terminals with a tester. Terminal / Normal / Abnormal 9-10 / 110(±35)mΩ / Open or Short
2kW heater (230V, 1 phase) 	Terminal / Normal / Abnormal 1-2 / 26.5(+3/-1.3)Ω / Open or Short
2 + 4kW heater (230V, 1 phase) 	Terminal / Normal / Abnormal 1-2 / 26.5(+3/-1.3)Ω / Open or Short 3-4 / 13.3(+1.5/-0.6)Ω / Open or Short
3 + 6kW heater (400V, 3 phase) 	Terminal / Normal / Abnormal 1-2=2-3=1-3 / 105.8(+11.8/-5)Ω / Open or Short 4-5=5-6=4-6 / 52.9(+5.8/-2.5)Ω / Open or Short
3 + 6kW heater (230V, 3 phase) 	Terminal / Normal / Abnormal 1-2=2-3=3-1 / 35.3(+3.9/-1.8)Ω / Open or Short 4-5=5-6=6-4 / 17.6(+1.9/-0.9)Ω / Open or Short

<table>
<tr><th>Part Name</th><th>Check Points</th></tr>
<tr><td><u>Flow switch</u>
 
</td><td>Measure the resistance between the terminals with a tester.

<table>
<tr><th>State of moving part</th><th>Normal</th><th>Abnormal</th></tr>
<tr><td>Paddle vertical (Flow < 5.5 l/min)</td><td>Open</td><td>Other than open</td></tr>
<tr><td>Paddle inclined (Flow > 5.5 l/min)</td><td>Short</td><td>Other than short</td></tr>
</table></td></tr>
<tr><td><u>Thermistors</u></td><td>Disconnect the connector then measure the resistance with a tester.
(At ambient temperatures of 10 - 30°C.)

<table>
<tr><th>Thermistor</th><th>Normal</th><th>Abnormal</th></tr>
<tr><td>TH1</td><td rowspan="9">4.3 - 9.5 kΩ</td><td rowspan="9">Open or short</td></tr>
<tr><td>TH2</td></tr>
<tr><td>THW1</td></tr>
<tr><td>THW2</td></tr>
<tr><td>THW5</td></tr>
<tr><td>THW6</td></tr>
<tr><td>THW7</td></tr>
<tr><td>THW8</td></tr>
<tr><td>THW9</td></tr>
<tr><td>THWB1</td><td rowspan="2">40 - 100 kΩ</td><td rowspan="2">Open or short</td></tr>
<tr><td>THWB2</td></tr>
</table></td></tr>
</table>

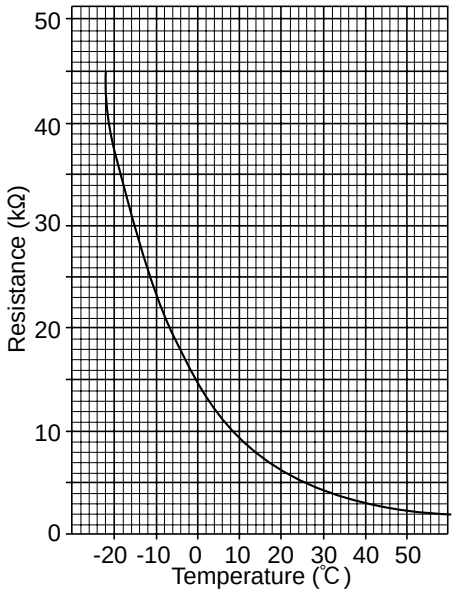
<Thermistor Characteristics Charts>

- Room temperature thermistor (TH1)
- Liquid refrigerant temperature thermistor (TH2)
- Flow water temperature thermistor (THW1)
- Return water temperature thermistor (THW2)
- DHW tank temperature thermistor (THW5)
- Zone 1 flow water temperature thermistor (THW6)
- Zone 1 return water temperature thermistor (THW7)
- Zone 2 flow water temperature thermistor (THW8)
- Zone 2 return water temperature thermistor (THW9)

Thermistor R0 = 15kΩ ± 3%
B constant = 3480 ± 2%

$$Rt = 15\exp\left\{3480\left(\frac{1}{273+t} - \frac{1}{273}\right)\right\}$$

0°C	15kΩ
10°C	9.6kΩ
20°C	6.3kΩ
25°C	5.2kΩ
30°C	4.3kΩ
40°C	3.0kΩ

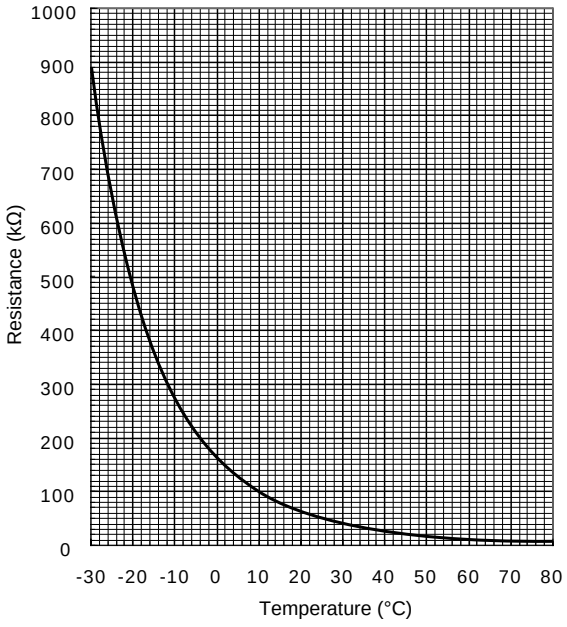


- Boiler flow water temperature thermistor (THWB1)
- Boiler return water temperature thermistor (THWB2)

Thermistor R100 = 3.3kΩ ± 2%
B constant = 3970 ± 1%

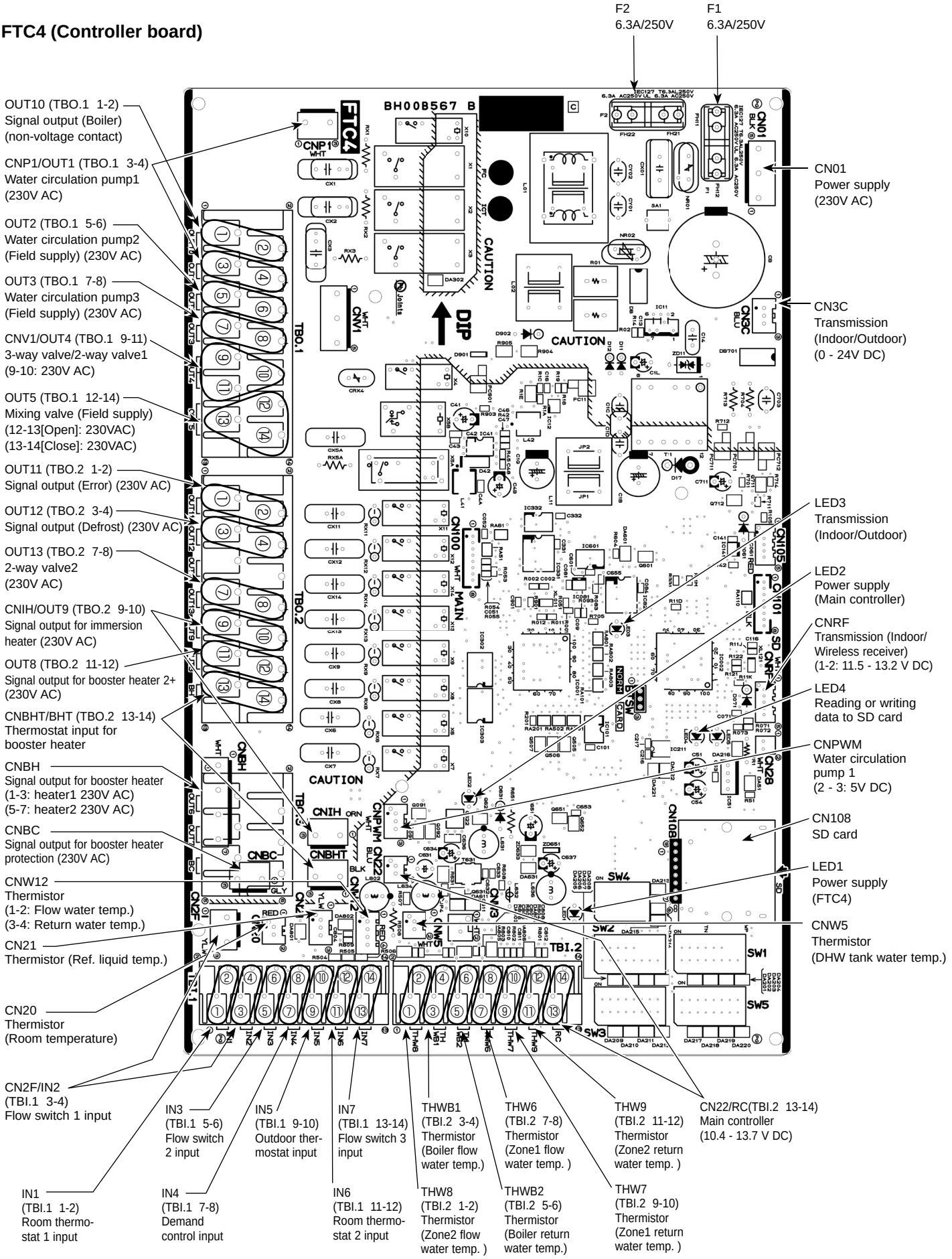
$$Rt = 3.3\exp\left\{3970\left(\frac{1}{273+t} - \frac{1}{273}\right)\right\}$$

0°C	162.8kΩ
10°C	97.4kΩ
20°C	60.3kΩ
25°C	48.1kΩ
30°C	38.6kΩ
40°C	25.4kΩ
50°C	17.1kΩ
60°C	11.9kΩ
70°C	8.4kΩ
80°C	6.0kΩ



10-7. Test point diagram

FTC4 (Controller board)



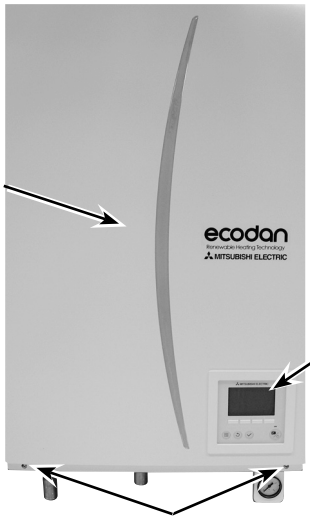
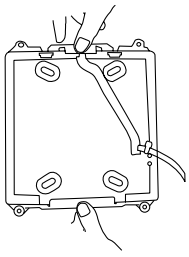
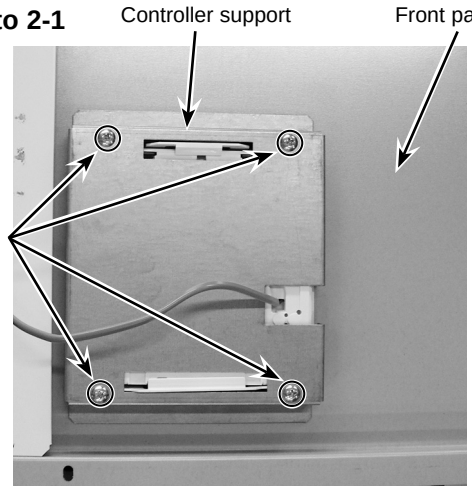
11 DISASSEMBLY PROCEDURE

<Preparation for the repair service>

- Prepare the proper tools.
- Prepare the proper protectors.
- Provide adequate ventilation.
- After stopping the operation of the cylinder and outdoor unit, turn off the power-supply breaker and remove the power plug.
- Discharge the condenser before the work involving the electric parts.
- Allow parts to cool.
- Do not expose the electric parts to water.
- When replacing or servicing water circuit parts, drain system first.

EHSC-VM2B, EHSC-VM6B, EHSC-YM9B, EHSC-TM9B, EHSC-VM6EB, EHSC-YM9EB, EHPX-VM2B, EHPX-VM6B, EHPX-YM9B, ERSC-VM2B

Check individual illustrations and positions of the parts by referring to the parts catalog included in this manual.
Some lead wires and pipes are bundled with Bands. Cut the bands to undo the fastened pipes and lead wires if necessary. When bundling the lead wires and pipes again, use new commercially available bands.
When removing the parts associated with water pipe work, drain the hydrobox as necessary. (Refer to "Draining the Hydrobox" on page 30.)
When draining the hydrobox, keep water from splashing on the internal parts (mainly electric parts and insulations).

DISASSEMBLY PROCEDURE	PHOTOS & ILLUSTRATION
1. How to remove the front panel (1) Remove the 2 screws at the bottom of the hydrobox. (Photo 1-1) (2) Slightly lift and pull out the front panel from the hydrobox. (Photo 1-1) (3) Disconnect the relay connector connecting from the main controller. (Photo 1-2) **Photo 1-2** Connector 	**Photo 1-1** 
2. How to remove the main controller (1) Remove the front panel. (Refer to Procedure 1). (2) Turn the front panel over and remove the 4 screws retaining the controller support. (Photo 2-1) (3) Remove the main controller from the case while moving up the claw at the top of the case. (Figure 2-1) **Figure 2-1** 	**Photo 2-1** 

DISASSEMBLY PROCEDURE

3. How to remove the electrical parts

(Steps (1) through (3) are applied to all the following parts.)

(1) Remove the front panel. (Refer to Procedure 1).

(2) Remove the 4 screws holding the control box cover. (Photo 3-1)

(3) Slightly lift and pull out the control box cover. (Photo 3-1)

<Earth leakage circuit breaker> (Photo 3-2)

(4) Disconnect all the lead wires from the earth leakage circuit breaker.

(5) Remove the 2 screws on the earth leakage circuit breaker.

Note:To avoid dropping of the breaker, hold the breaker by hand when removing the last screws.

<Contactor> (Photo 3-2)

(4) Disconnect all the lead wires from the contactors.

(5) Remove the 2 screws on each contactor.

Note:To avoid dropping of the contactors, hold the contactors by hand when removing the last screws.
To prevent an electrical shock, wait until all the LED lamps on the FTC4 control board are turned off.

<Terminal block> (Photo 3-2)

(4) Disconnect all the lead wires from the terminal block. (To disconnect the S1, S2 and S3 lead wires, disengage the locks by pressing on the claws.)

(5) Remove the screw on the terminal block.

Note: To avoid dropping of the terminal block, hold the terminal block by hand when removing the screw .

<Controller board> (Photo 3-3)

(4) Disconnect all the lead wires from the controller board.

(5) Remove the controller board from the 6 board supports.

PHOTOS

Photo 3-1

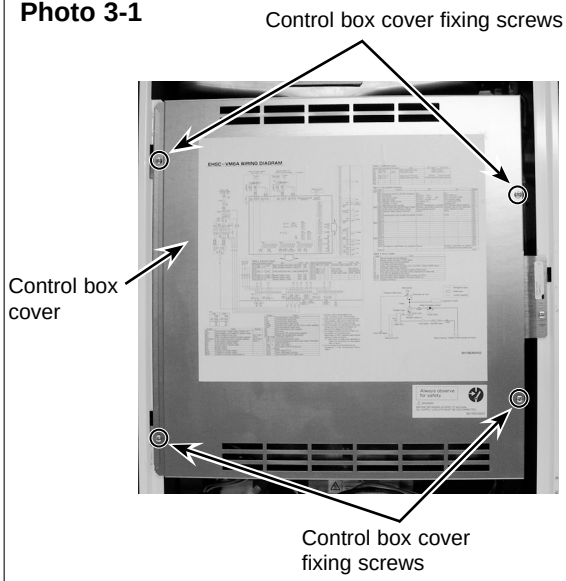
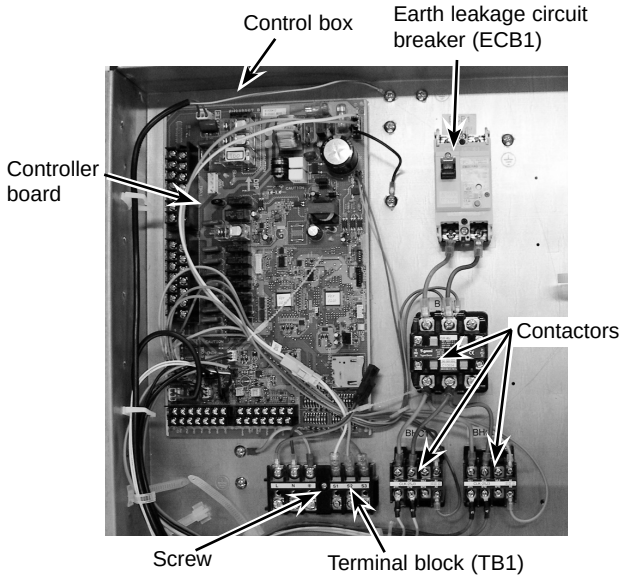
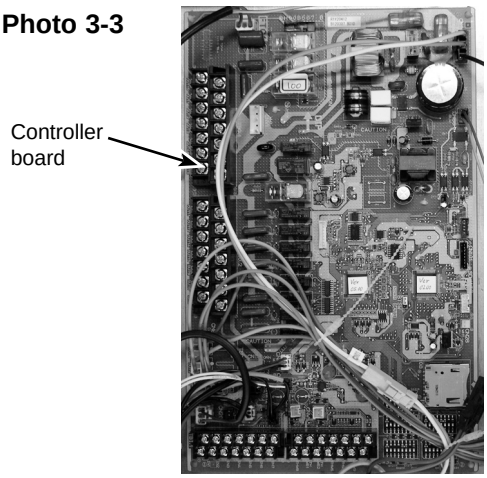


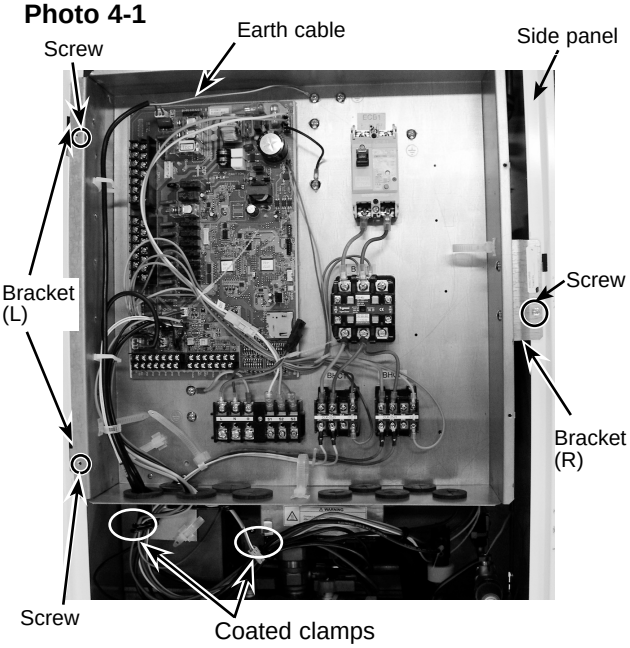
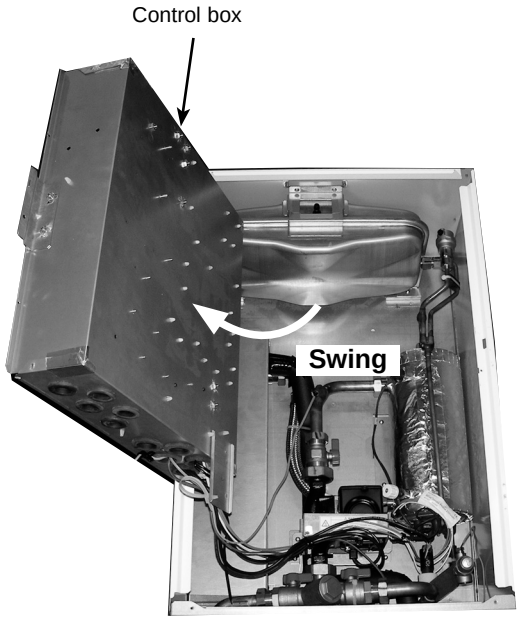
Photo 3-2



* The photos shown are of the EHSC model.

Photo 3-3



DISASSEMBLY PROCEDURE	PHOTOS
4. How to swing the control box to the front (1) Remove the front panel. (Refer to Procedure 1.) (2) Remove the control box cover. (Refer to Procedure 3.) *If the screw of the control box bracket (R) and 2 screws of the control box bracket (L) are removed, the control box can be swung to the front without removing control box cover. (3) Remove the screw from the control box bracket (R) and 2 screws from the control box bracket (L). (4) Remove the coated clamps. (5) Disengage the control box bracket (R) from the right-hand side panel and pull the control box. At this point, lifting slightly and pulling the control box will swing the control box to the front. (Photo 4-2) Note: Remove the field wiring as necessary.	**Photo 4-1**  * The photos shown are of the EHSC model. **Photo 4-2** 

DISASSEMBLY PROCEDURE

5. How to remove water pump/ pump valve

<Water pump>

Close the 2 pump valves (OFF) before removing the water pump, and open the valves (ON) after reinstalling the water pump**.**

(1) Remove the front panel. (Refer to Procedure 1.)
(2) Remove the control box cover. (Refer to Procedure 3.)
(3) Disconnect the CNP1 connector, the earth cable, and the CNPWM connector in the control box. (Photo 5-1)
(4) Release the water pump lead wire from the 2 cable clamps, the cable strap, the 3 coated clamps and feed the lead wire out the control box without putting strain on the CNP1 connector. (Photo 5-1)
(5) Swing the control box to the front. (Refer to Procedure 4.)
(6) Remove the pump support top by removing the 2 screws holding it to the pump support under (Photo 5-2).
Note: To avoid dropping of the pump support top, hold it by hand when removing the last screw, .
(7) Close (OFF) the 2 pump valves and remove the G1-1/2" nuts using two spanners: one to hold the pump and the other to turn the individual nuts.
Remove the water pump by cutting the band fixing the pump to the pump support under. (Photos 5-2)

* When either of the pump valve handles is stiff, remove the handle and turn the vertical stem 90 degrees clockwise mainly by using a spanner. (Photo 5-4)
* Set the water pump in the orientation of the arrow printed on the water pump and in the way that the terminal box faces to the front. (Photo 5-2)
* When reinstalling the G1-1/2" nuts, use new G1-1/2" gaskets. (Photo 5-3)

<Pump valve>

(8) Remove the pump valves by removing the G1" nuts using two spanners: one to hold the pump and the other to turn each G1" nut . (Photo 5-2)

* When reinstalling the G1" nuts, use new G1" gaskets.
* When either of the pump valve handles is stiff, remove the handle and turn the vertical stem 90 degrees clockwise mainly by using a spanner. (Photo 5-4)
* When reinstalling the valves, place the handles to the right hand side of the valves.

Note: Skip Steps (3) and (4) above when replacing the pump valves only.
When replacing both the water pump and the pump valves, skip Step (7) above.

PHOTOS

Photo 5-1

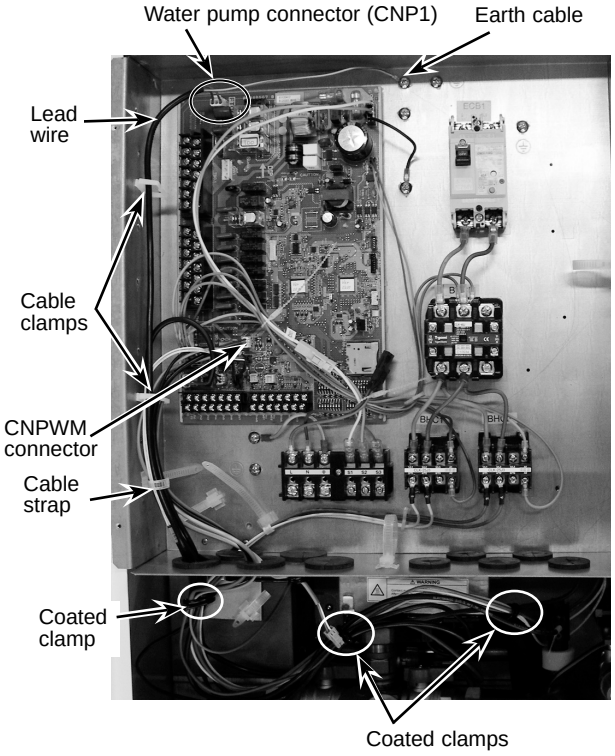


Photo 5-2

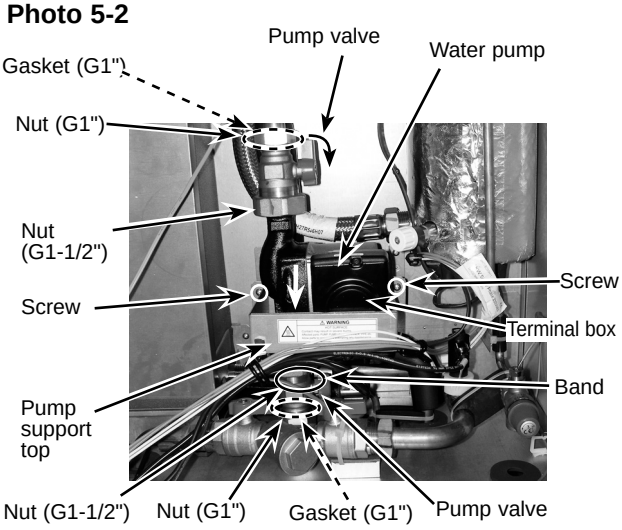


Photo 5-3

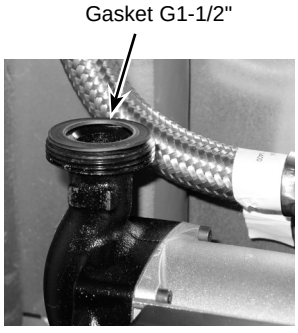
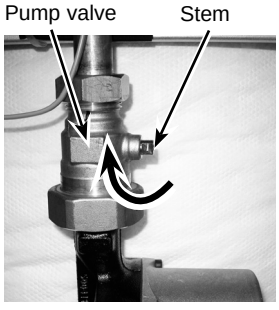


Photo 5-4



DISASSEMBLY PROCEDURE

6. How to remove the flow switch

(1) Remove the front panel. (Refer to Procedure 1.)
(2) Remove the control box cover. (Refer to Procedure 3.)
(3) Disconnect the CN2F connector on the controller board. (Photo 6-1)
(4) Release the flow switch lead wire from the 2 cable clamps, the cable strap, the 2 coated clamps and feed the lead wire out the control box without putting strain on the CN2F connector. (Photo 6-1)
(5) Swing the control box to the front. (Refer to Procedure 4.)
(6) Remove the flow switch by removing the nut. (Photo 6-2)
* When reinstalling the nut, use a new O-ring. (Photo 6-3)

Note: To ensure the correct functioning of the flow switch, check the following when installing it:
- The flow switch paddle is set perpendicularly to the water flow. (Photos 6-2, 6-4)
- The lead wire of the flow switch points to the left-hand side. (Photo 6-2)
- The lead wire runs parallel to the water pipe. (Figure 6-1)

Photo 6-4

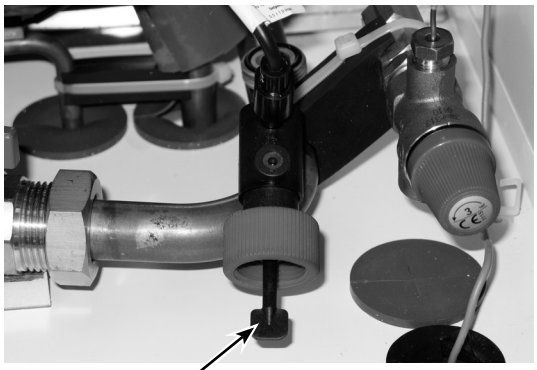


Figure 6-1

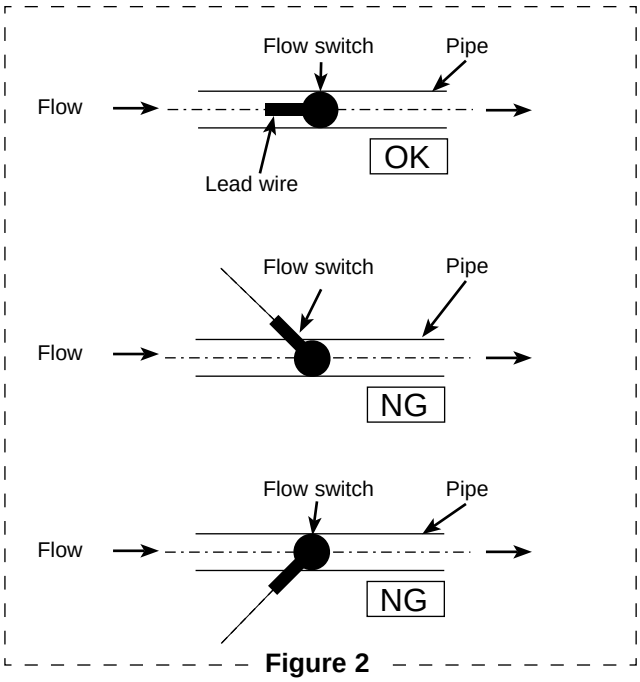


Figure 2

PHOTOS

Photo 6-1

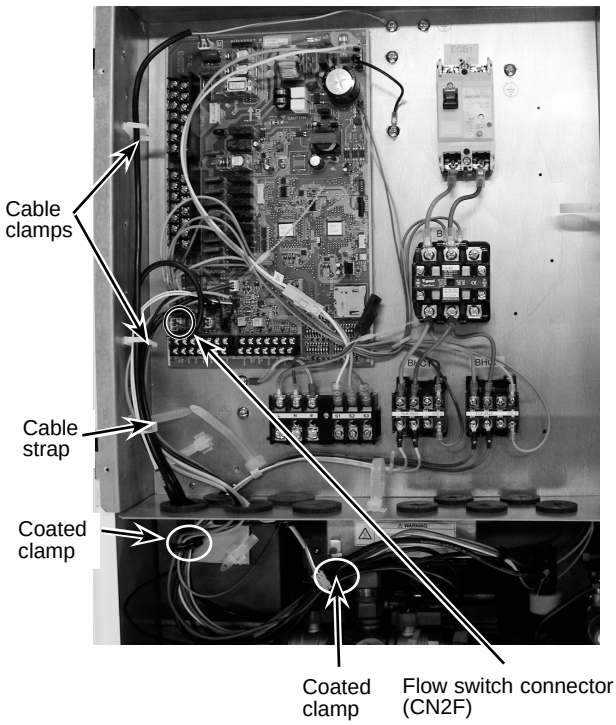


Photo 6-2

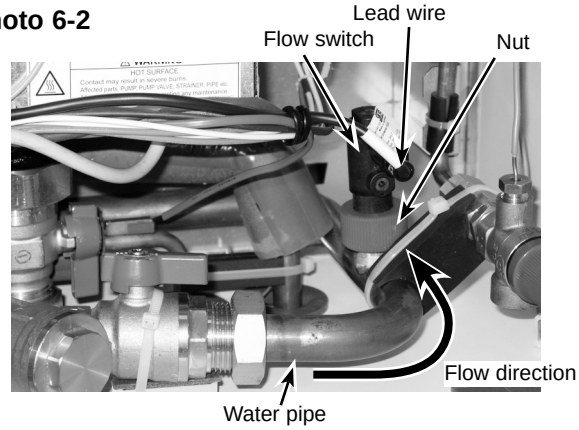
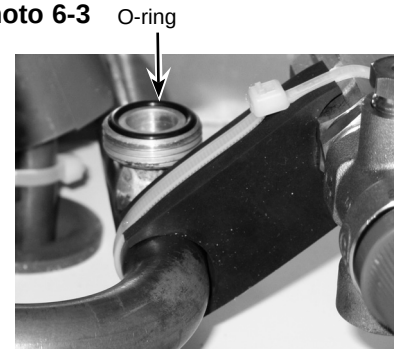


Photo 6-3



DISASSEMBLY PROCEDURE

7. How to remove the booster heater

(1) Remove the front panel. (Refer to Procedure 1.)
(2) Remove the control box cover. (Refer to Procedure 3.)
(3) Disconnect the booster heater lead wires from the CNBHT connector on the controller board and from the BHC1 (Lead wire No.1 and No.2) and BHC2 (Lead wire No.3 and No.4) contactors respectively. (Photo 7-1)
(4) Swing the control box to the front. (Refer to Procedure 4.)
Note: Do not mix up the lead wire numbers when re-connecting the lead wires to the contactors as the lead wire numbers are different dependent on the models.

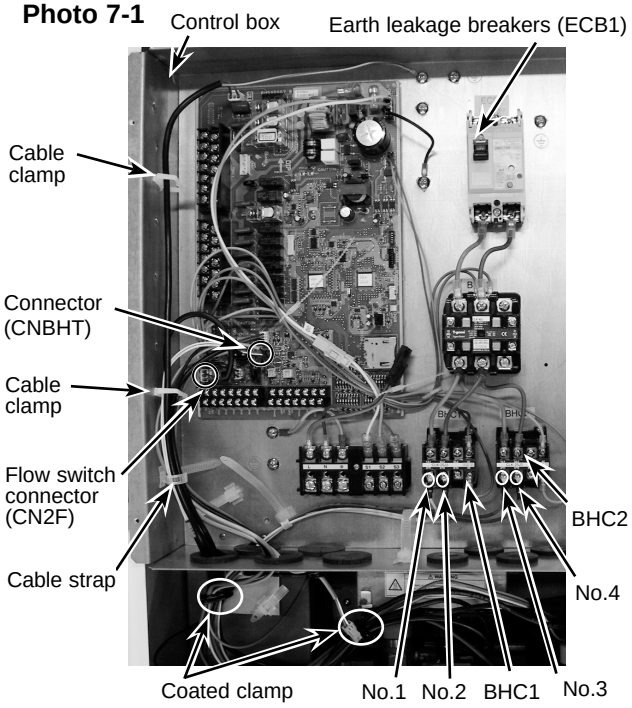
Model	Lead wire No.	Contactor
EHSC-VM6B	No.1	BHC1-U
EHSC-VM6EB	No.2	BHC1-V
EHPX-VM6B	No.3	BHC2-U
	No.4	BHC2-V
EHSC-YM9B	No.1	BHC1-U
EHSC-TM9B	No.2	BHC1-V
EHSC-YM9EB	No.3	BHC1-W
EHPX-YM9B	No.4	BHC2-U
	No.5	BHC2-V
	No.6	BHC2-W
EHSC-VM2B	No.1	BHC1-U
EHPX-VM2B	No.2	BHC1-V
ERSC-VM2B		

Refer to 6. WIRING DIAGRAM

(5) Close (OFF) the pump valve (upper).
(6) Remove the two G1" nuts. (Photo 7-2)
* When reinstalling the G1" nuts, use new G1" gaskets.
(7) Remove the flare nut (Photo 7-2).
(8) Remove the two screws that hold the heater stay onto the back panel. Lift the booster heater slightly and remove the booster heater with the heater stay from the back panel .
(9) Remove the 2 screws on the back of the heater stay and remove the heater stay from the booster heater. (Photo 7-3)
(10) Remove the drain cock (primary circuit) from the booster heater. (Photo 7-2)
* Replace the removed drain cock (primary circuit). The drain cock can not be reused.

PHOTOS

Photo 7-1



* The photos shown are of the EHSC-VM6B model.

Photo 7-2

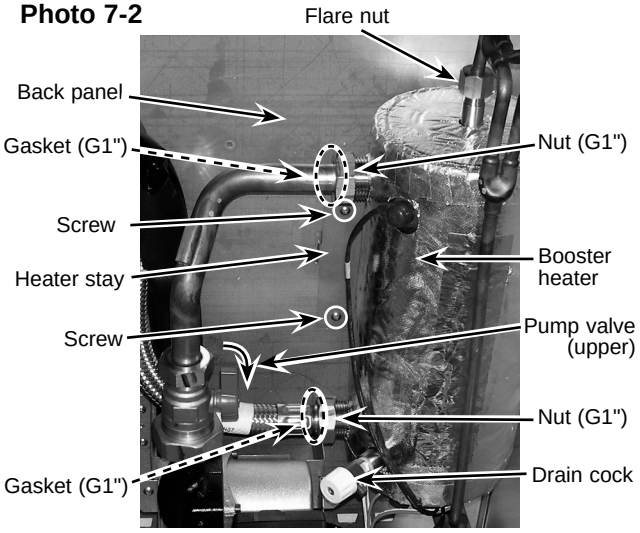
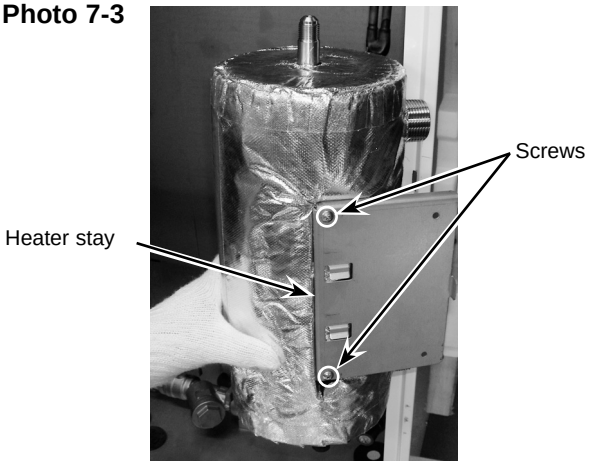


Photo 7-3

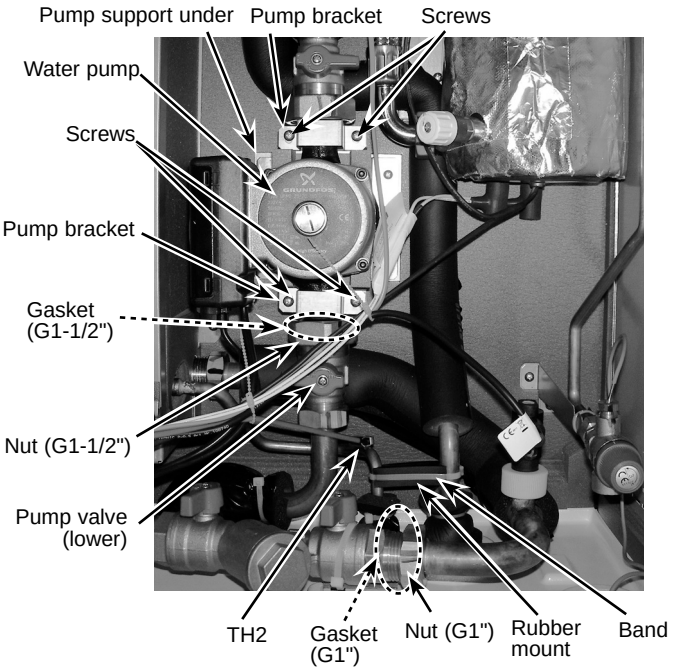


DISASSEMBLY PROCEDURE

8. How to remove the plate heat exchanger

(1) Pump down the refrigerant circuit and close the stop valve on the indoor unit. (Refer to "12. Supplementary information".)
(2) Remove the front panel. (Refer to Procedure 1.)
(3) Remove the control box cover. (Refer to Procedure 3.)
(4) Disconnect the CNP1 connector on the controller board and the earth cable in the control box.
(5) Release the water pump lead wire from the 2 cable clamps, the cable strap, the 2 coated clamps, and feed the lead wire out the control box without putting strain on the CNP1 connector.
(6) Swing the control box to the front. (Refer to Procedure 4.)
(7) Remove the pump support top by removing the 2 screws that hold it to the pump support under. (Photo 8-2)
Note: To avoid dropping of the pump support top, hold it by hand when removing the last screw.
(8) Remove the THW1 and TH2 thermistors from the thermistor holders respectively. (Photo 8-2)
(9) Close the pump valve (lower) and remove the G1-1/2" nut using two spanners: one to hold the pump valve and the other to turn the nut.
* When reinstalling the G1-1/2" nut, use a new G1-1/2" gasket. (Photo 5-3)
(10) Remove the G1" nut (upper) on the booster heater and the water pump with the pump valve and the water pipe. (Photo 8-2)
* When reinstalling the G1" nut, use a new G1" gasket.

Photo 8-3 **ERSC-VM2B only**



PHOTOS

Photo 8-1

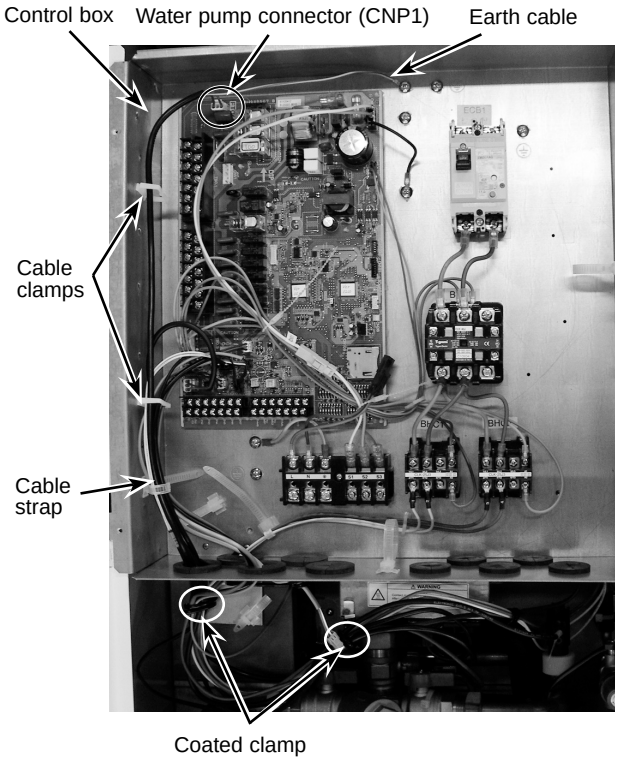
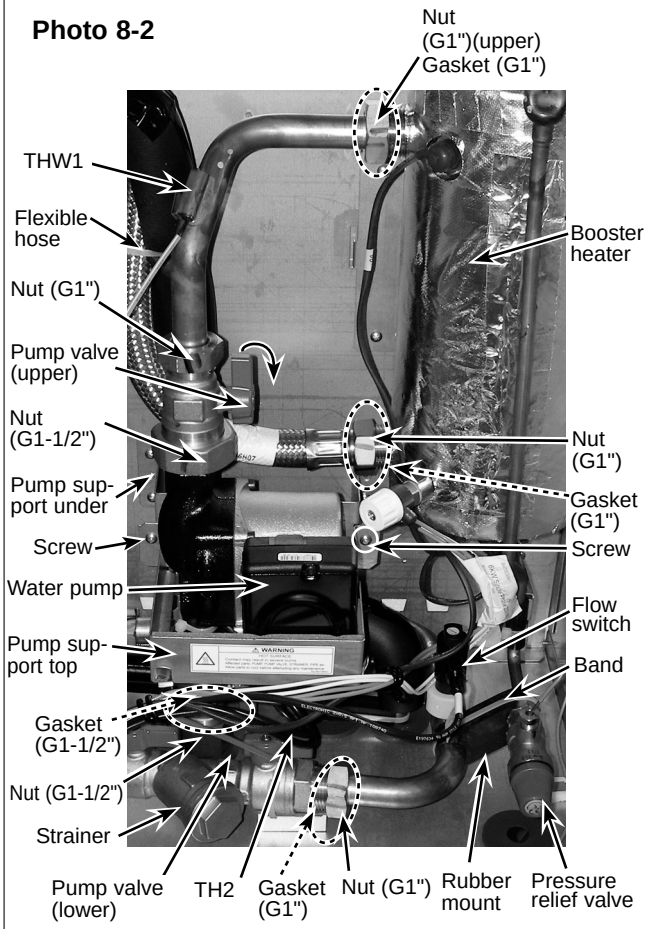


Photo 8-2



DISASSEMBLY PROCEDURE

8. How to remove the plate heat exchanger (continued)

(11) Remove the pump support under by removing the 4 screws. (Photo 8-4,5)
Note: To avoid dropping of the pump support under, hold it by hand when removing the last screw.

(12) Remove the G1" nut on the flexible hose end that connects to the booster heater. (Photo 8-2)
* When reinstalling the G1" nut, use a new G1" gasket.

(13) Close the strainer valve and remove the G1" nut on the water outlet side of the strainer using two spanners: one to hold the strainer and the other to turn the G1" nut. (Photo 8-2)
* When reinstalling the G1" nut, use a new G1" gasket.

(14) Remove the rubber mount by cutting the band. (Photo 8-2)

(15) Remove the flow switch. (Refer to Procedure 6.)
* Do not remove the CN2F connector on the controller board.
* When reinstalling the flow switch, use a new O-ring.

(16) Remove the flare nuts on the gas and liquid pipes under the hydrobox using two spanners: one to hold each flare joint and the other to turn each flare nut.

(17) Remove the water coil cover by removing the 2 screws. (Photo 8-6)

(18) Remove the plate heat exchanger assembly from the hydrobox. Cut the band and remove the flexible hose by removing the G1" nut at the top of the plate heat exchanger. Remove the G1" nut at the bottom of the plate heat exchanger. (Photos 8-7, 8-8, 8-9)
* When reinstalling the G1" nuts, use new G1" gaskets.

Photo 8-8

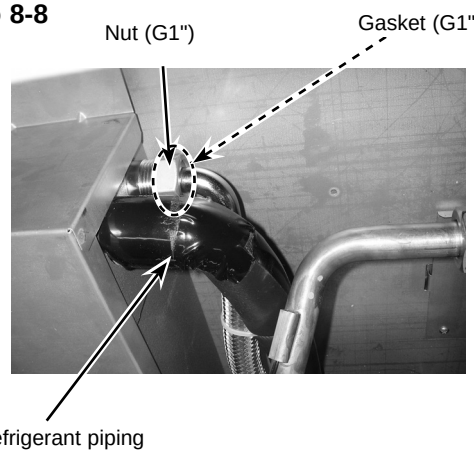
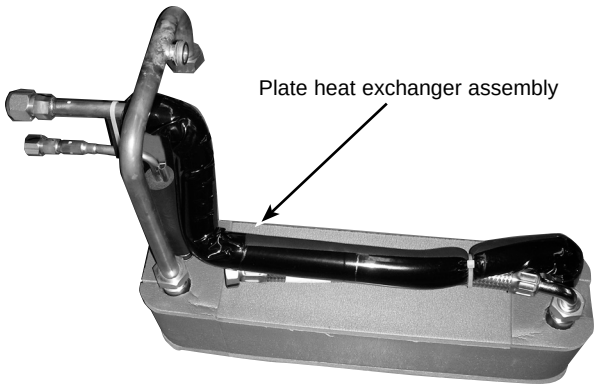


Photo 8-9



PHOTOS

Photo 8-4

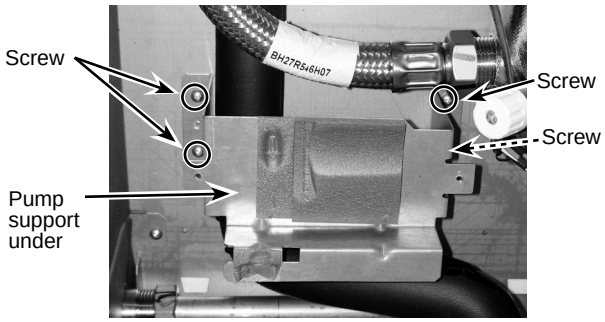


Photo 8-5 **ERSC-VM2B only**

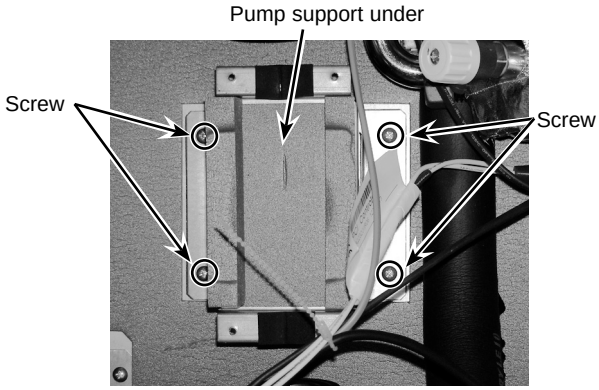


Photo 8-6

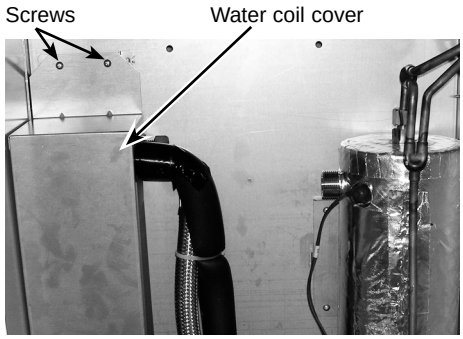
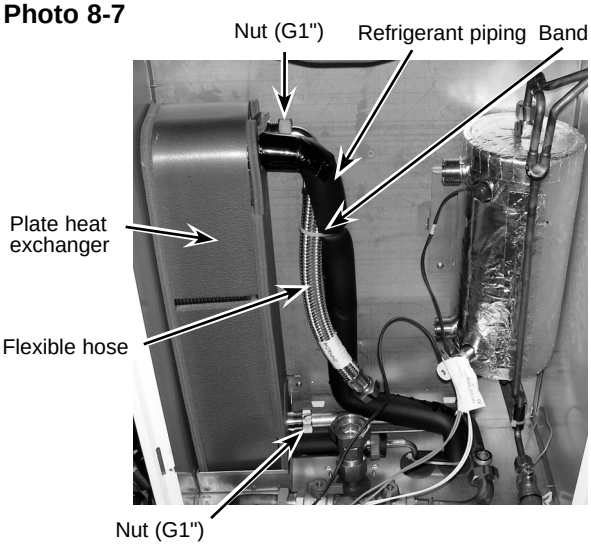
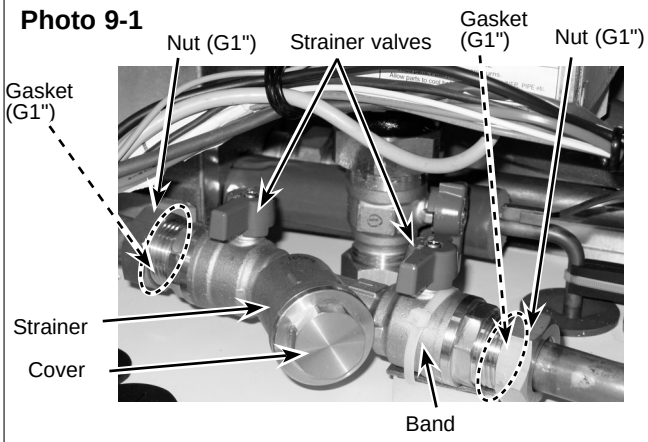
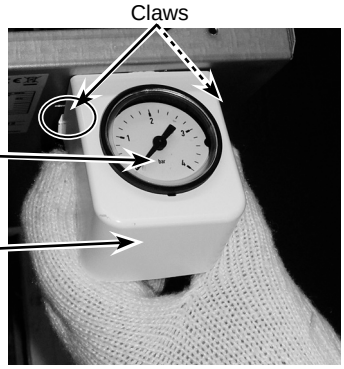
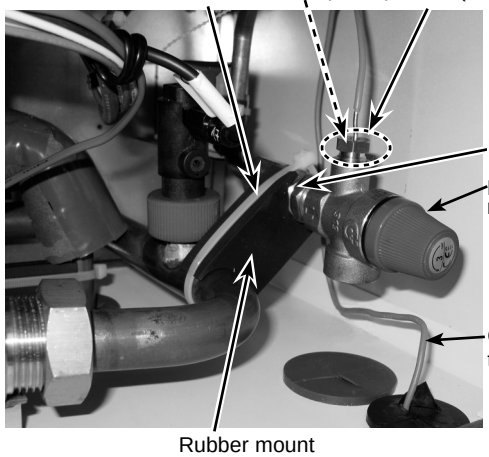
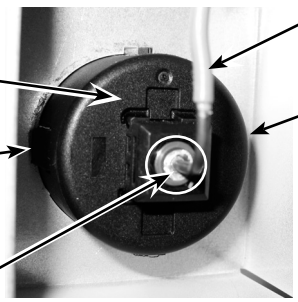
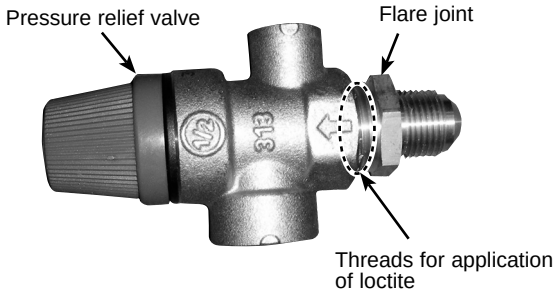
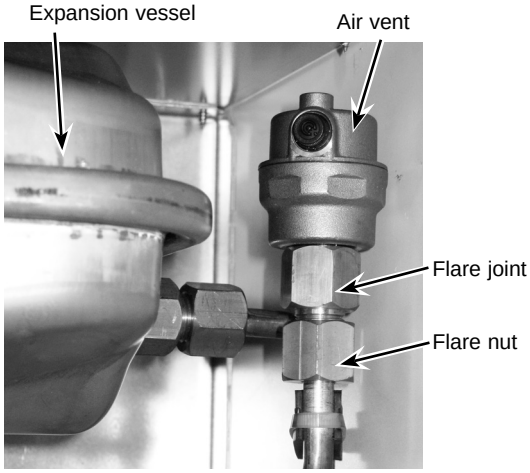
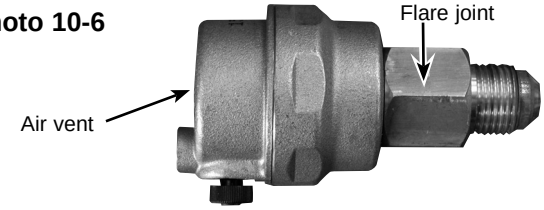
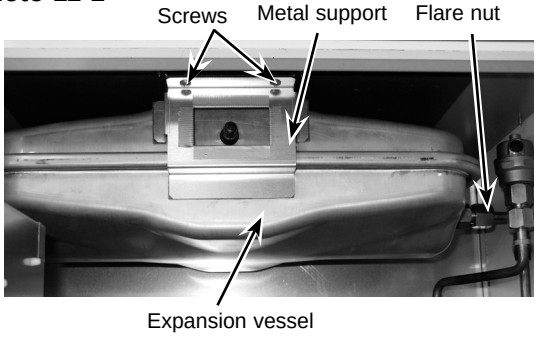
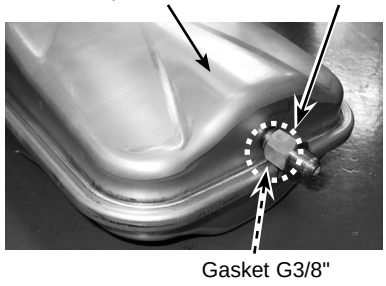
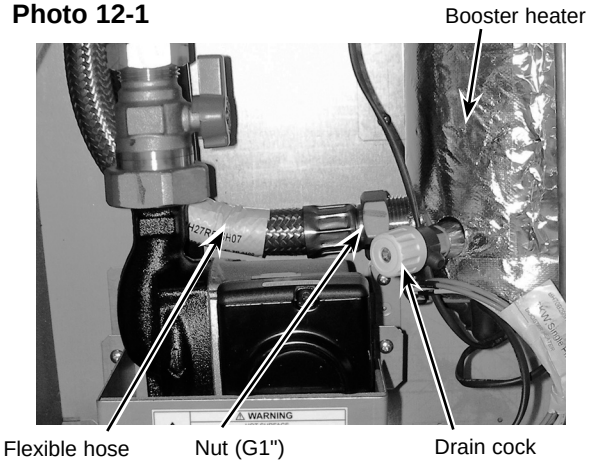
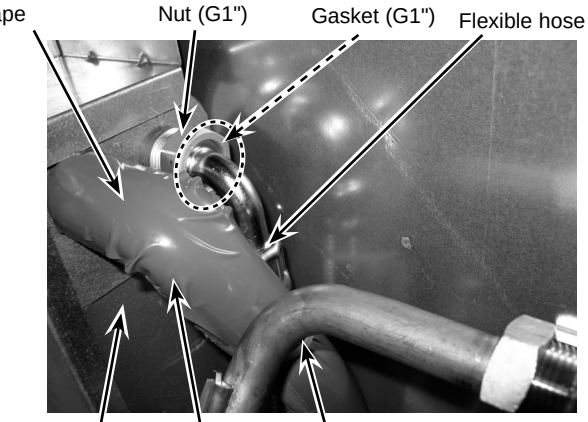
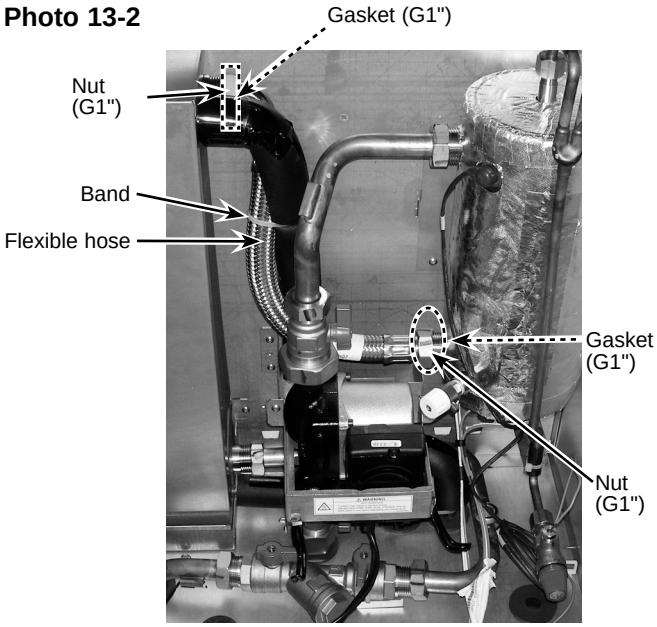


Photo 8-7



DISASSEMBLY PROCEDURE	PHOTOS
9. How to remove the strainer (1) Remove the front panel. (Refer to Procedure 1.) (2) Cut the band. (3) Close the strainer valve (OFF). * When either of the pump valve handles is stiff, remove the handle and turn the vertical stem 90 degrees clockwise mainly by using a spanner. (Photo 5-4) (4) Remove the two G1" nuts using two spanners: one to hold the strainer and the other to turn the individual G1" nuts. * When reinstalling the G1" nuts, use new G1" gaskets **<Removal of the strainer cover (debris recovery)>** (4) Remove the cover with two spanners: one to hold the strainer and the other to turn the cover. * Be sure to reattach the mesh after washing. (Photo 9-2) * When reinstalling the cover , use a new O-ring.	**Photo 9-1**  **Photo 9-2**
10. How to remove the manometer / pressure relief valve / air vent (automatic) (1) Remove the front panel. (Refer to Procedure 1.) (2) Swing the control box to the front. (Refer to Procedure 4.) **<Manometer>** (3) Hold the sides of the manometer cover, disengage the claws, and remove the manometer. (Photo 10-1) (4) Remove the G1/4" nut and feed the capillary tube through the bottom out the hydrobox. * When reinstalling the G1/4" nut, use a new G1/4" gasket. (Photo 10-2) (5) Remove the manometer from the manometer cover while pressing on the claws. (Photo 10-3) * When reinstalling the manometer assembly on the hydrobox beware not to put strain on the root of the capillary tube as the capillary tube is easy to break at the root. **<Pressure relief valve>** (3) Remove the field piping from the pressure relief valve. (4) Remove the manometer by removing the G1/4" nut. * When reinstalling the G1/4" nut, use a new G1/4" gasket. (Photo 10-2) (5) Cut the band and remove the rubber mount. (Photo 10-2) (6) Remove the pressure relief valve with a flare joint using two spanners: one to hold the flare joint and the other to turn the flare nut. (Photo 10-2) (7) Remove the pressure relief valve using two spanners: one to hold the flare joint and the other to turn the pressure relief valve. (Photo 10-4) (8) Eliminate locktite on the thread surfaces using remover. (Photo 10-4) * Before reinstallation, apply locktite over the thread surface on the pressure relief valve. * For more details about the locktite and the remover, refer to Page 81.	**Photo 10-1**  **Photo 10-2**  **Photo 10-3** 

DISASSEMBLY PROCEDURE	PHOTOS
10. How to remove the manometer / pressure relief valve / air vent (automatic) (Continued) **<Air vent (automatic)>** (1) Remove the air vent with a flare joint using two spanners: one to hold the flare joint and the other to turn the flare nut. (2) Remove the flare joint from the air vent. (Photo 10-6)	**Photo 10-4**  **Photo 10-5**  **Photo 10-6** 
11. How to remove the expansion vessel (1) Remove the front panel. (Refer to Procedure 1.) (2) Swing the control box to the front. (Refer to Procedure 4.) (3) Remove the flare nut using two spanners: one to hold the flare joint and the other to turn the flare nut. (Photo 11-1) (4) Remove the 2 screws on the metal support. Note: To avoid dropping of the expansion vessel, hold the expansion vessel with the metal support by hand when removing the last screw. (5) Pull out the metal support. (Photo 11-1) (6) Pull out the expansion vessel. (Photo 11-1) (7) Remove the flare joint from the expansion vessel. (Photo 11-2) * When reinstalling the flare joint, use a new G3/8" gasket. Note: To avoid dropping of the expansion vessel, hold it securely when removing it.	**Photo 11-1**  **Photo 11-2** 

DISASSEMBLY PROCEDURE	PHOTOS
12. How to remove the drain cock (primary circuit) (1) Remove the front panel. (Refer to Procedure 1.) (2) Swing the control box to the front. (Refer to Procedure 4.) (3) Remove the drain cock (primary circuit).	**Photo 12-1** 
13. How to remove the flexible hose (1) Remove the front panel. (Refer to Procedure 1.) (2) Swing the control box to the front. (Refer to Procedure 4.) (3) Cut the band. (Photo 13-1, 13-2) (4) Cut the pipe cover tape about 10 cm from the top and peel off the pipe cover. (Photo 13-1) * Reattach the pipe cover after reconnecting the flexible hose. (5) Loosen the flexible hose nuts on both ends and remove the flexible hose. (Photos 13-1, 13-2) * When reinstalling the nuts, use new G1" gaskets.	**Photo 13-1** 
Photo 13-2  	

DISASSEMBLY PROCEDURE

14. How to remove the thermistor <liquid refrigerant temp.> (TH2) / thermistor <flow water temp. & return water temp.> (THW1, THW2)

(1) Remove the front panel. (Refer to Procedure 1.)
(2) Remove the control box cover. (Refer to Procedure 3.)
(3) Disconnect the following connectors on the control board.
- TH2 (TH2)
- THW1, THW2 (THW12)

(4) Release the THW12 and TH2 lead wires from the cable clamp, the cable strap and the 2 coated clamps. Feed the lead wires out the control box without putting strain on their connectors.
(5) Swing the control box to the front. (Refer to Procedure 4.)
(6) Remove the thermistors from the thermistor holders. (Photo 14-2)

PHOTOS

Photo 14-1

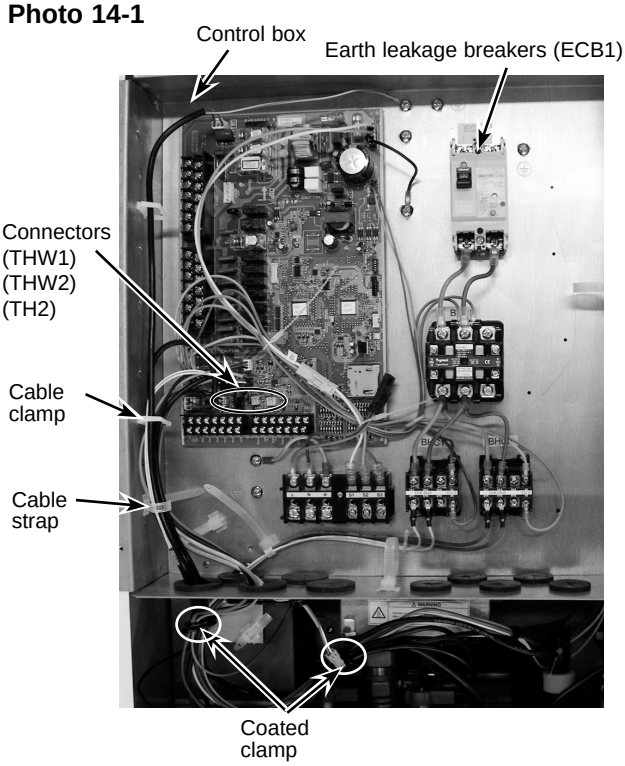
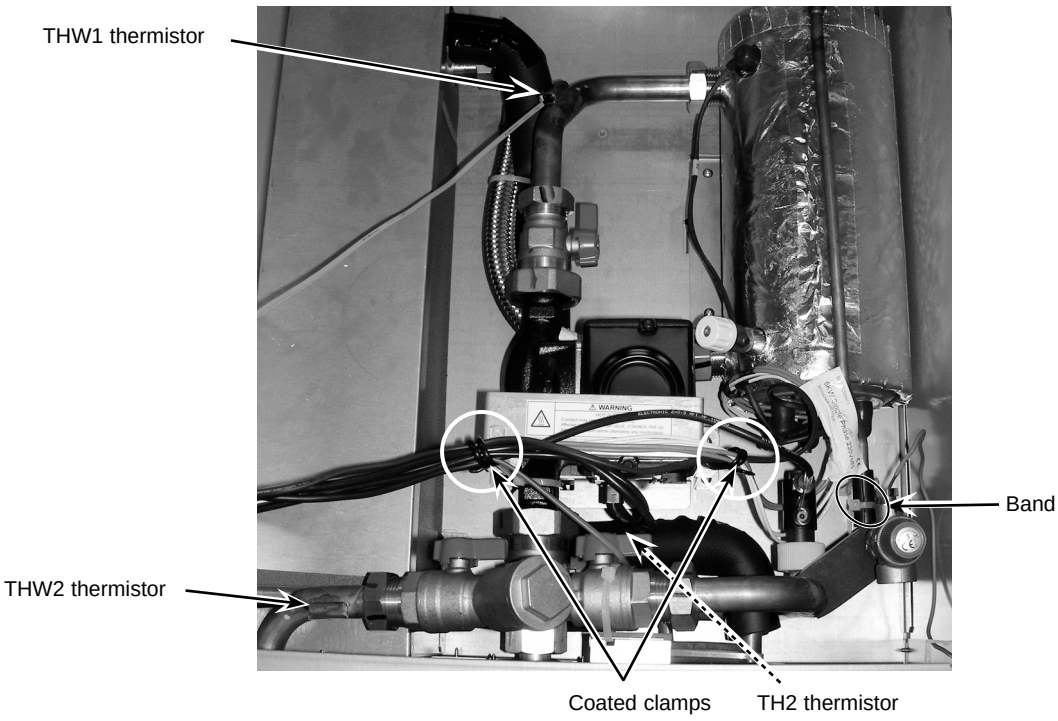


Photo 14-2



DISASSEMBLY PROCEDURE

15. How to remove the drain pan (ERSC-VM2B only)

(1) Remove the front panel.
(2) Disconnect all the field piping.
(3) Cut the band holding the strainer. (Photo 15-2)
(4) Remove 3 screws on the cover plate. (Photo 15-3)
(5) Remove the cover plate. (Photo 15-4)
(6) Remove 3 screws each on the side panel (L, R), and 2 screws on the underneath surface and base assy from the hydrobox. (Photo 15-5)
(7) Remove 5 screws on the base assy. (Photo 15-6)
(8) Remove the drain pan from the base. (Photo 15-7)

PHOTOS

Photo 15-1

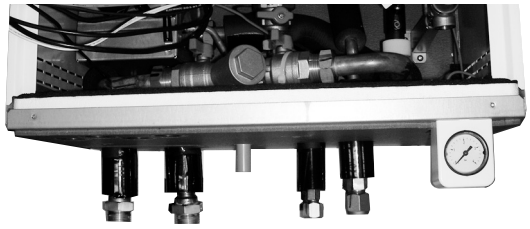


Photo 15-2

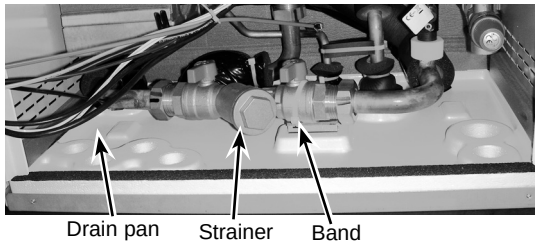


Photo 15-3

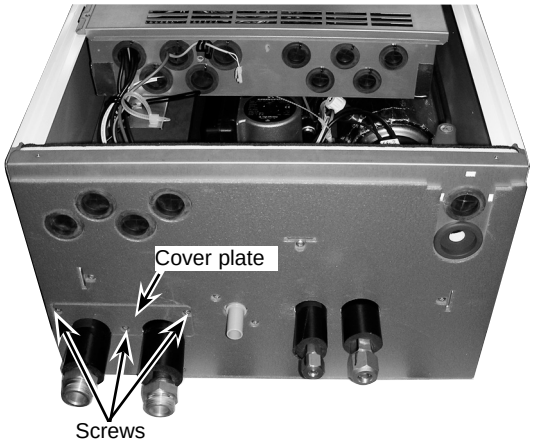


Photo 15-4

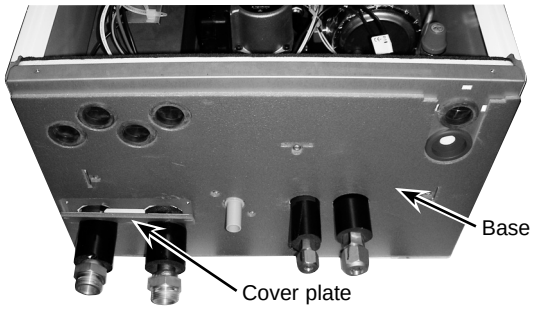


Photo 15-5

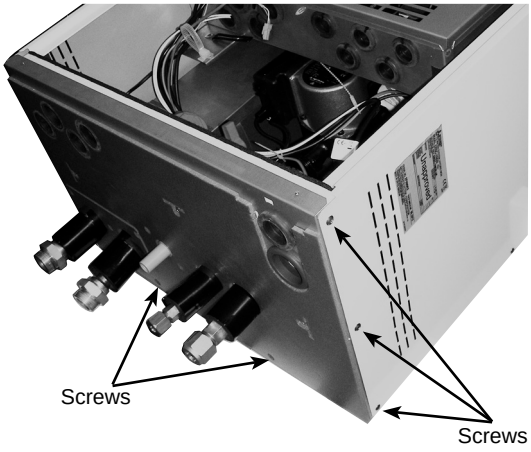


Photo 15-6

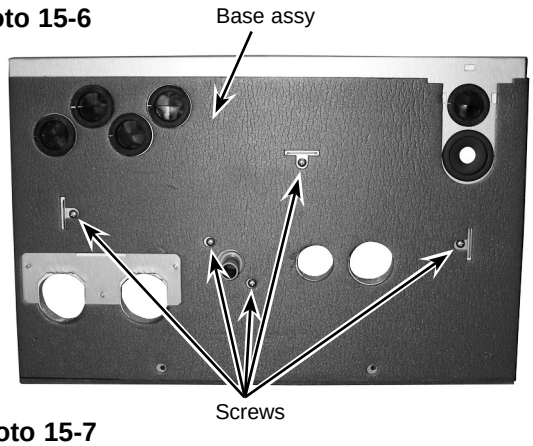
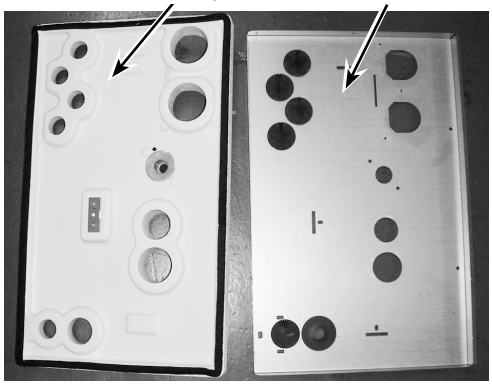


Photo 15-7



Notes on replacing the parts

Replacement of the parts listed below requires the following procedure.
After the parts are removed, eliminate loctite on threads by applying loctite remover, apply new loctite, and then install and tighten the parts to the specified tightening torques below. For details about recommended loctite and loctite remover, refer to Table 11-1, and for details about the replacement parts and their tightening torques, refer to Table 11-2.

Table 11-1

Recommended	Manufacturer	No.	Note
Loctite	Henkel	Loctite 577	Apply loctite all over from the end of external thread to the second ridge. After installing the parts, fix the parts for at least 30 minutes
Loctite remover	Henkel	Loctite 7200 Gasket Remover	Spray loctite remover over sealant on the threads, let the sealant sit until soft, and then eliminate it with a wire brush.

Note: When using the products above, refer to the appropriate manuals that come with the individual products.

Table 11-2

Part name *1	Recommended tightening torque [Nm] *2
PRESSURE RELIEF VALVE 3bar	15 ± 1

*1. For more details about the listed parts refer to the parts catalogue included in this manual.
*2. Undertightening and overtightening the parts affect water seal life. Tighten the parts to the appropriate tightening torques.

When installing the parts that are not listed above, observe the tightening torques in accordance with Table 11–3.
Always use a new O–ring or gasket.

Table 11-3

Size [inch]		Recommended tightening torque [Nm]
Gasket	G1/4"	8 ± 1
	G3/8"	15 ± 1
	G1"	42 ± 2
	G1 1/2"	42 ± 2
O-ring	Strainer cover	45 ± 4.5
	Flow switch	8 ± 1
	Air vent (Automatic)	15 ± 1
Attached packing	Drain cock (primary circuit)	15 ± 1
Flare joint (for water circuit parts)		35 ± 2

After the procedure is complete, ensure that no water leaks.

12 SUPPLEMENTARY INFORMATION

12-1. Refrigerant collecting (pumpdown) for split model systems only

Refer to “Refrigerant collection” in the outdoor unit installation manual or service manual.

12-2. Back-up operation of boiler

Heating operation is backed up by boiler.
For more details, refer to the installation manual of PAC-TH011HT-E.

<Installation & System set up>

1. Set Dip-SW 1-1 to ON "With boiler" and SW2-6 to ON “With Mixing tank”.
2. Install the thermistors THWB1 (Flow temp.) and THWB2 (return temp.) *1 on the boiler circuit.
3. Connect the output wire (OUT10: Boiler operation) to the input (room thermostat input) on the boiler. *2
4. Install one of the following room temp. thermostats. *3

- Wireless remote controller (option)
- Room temp. thermostat (field supply)
- Main controller (remote position)

*1 The boiler temp. thermistor is an optional part.
*2 OUT10 has no voltage across it.
*3 Boiler heating is controlled on/off by the room temp. thermostat.

<Remote controller settings>

1. Go to Service menu > Heat source setting and choose “Boiler” or “Auto”. *4
2. Go to Service menu > Operation settings > Boiler settings to make detailed settings for “Auto” above .

*4 The “Auto” automatically switches heat sources between Heat pump (and Electric heater) and boiler.

13 SERVICE AND MAINTENANCE

The main controller settings changed from the default settings are reset by replacing the controller board. To facilitate reselecting settings on the main controller, it is recommended to write down the changes in the sheet below before replacement.

13-1. Engineers Forms (1/2)

Should settings be changed from default, please enter and record new setting in 'Field Setting' column. This will ease resetting in the future should the system use change or the circuit board need to be replaced.

Commissioning/Field settings record sheet

Main controller screen				Parameters	Default setting	Field setting	Notes
Main			Zone1 heating room temp	10°C - 30°C	20°C		
			Zone2 heating room temp *1	10°C - 30°C	20°C		
			Zone1 heating flow temp	25°C - 60°C	45°C		
			Zone2 heating flow temp *1	25°C - 60°C	35°C		
			Cooling flow temp *2	5°C - 25°C	15°C		
			Zone1 heating compensation curve	−9°C - + 9°C	0°C		
			Zone2 heating compensation curve *1	−9°C - + 9°C	0°C		
			Holiday mode	Active/Non active/Set time	–		
Option			Forced DHW operation	On/Off	–		
			DHW	On/Off/Timer	On		
			Heating	On/Off/Timer	On		
			Holiday mode	Active/Non active/Set time	–		
Setting	DHW *3		Operation mode	Normal/Eco	Normal		
			DHW max. temp.	40°C - 60°C	50°C		
			DHW temp. drop	5°C - 30°C	10°C		
			DHW max. operation time	30 - 120 mins	60 mins		
			DHW mode restriction	30 - 120 mins	30 mins		
	Legionella prevention *3		Active	Yes/No	Yes		
			Hot water temp	60°C - 70°C	65°C		
			Frequency	1 - 30 days	15 days		
			Start time	00.00 - 23.00	03.00		
			Max. operation time	1 - 5 hours	3 hours		
			Duration of maximum temp.	1 - 120 mins	30 min		
	Heating/Cooling *2		Zone1 operation mode	Heating room temp/Heating flow temp/Heating compensation curve/Cooling flow temp	Room temp		
			Zone2 operation mode *1	Heating room temp/Heating flow temp/Heating compensation curve	Compensation curve		
	Compensation curve	Hi set point	Zone1 outdoor ambient temp	−15°C - +35°C	–15°C		
			Zone1 flow temp	25°C – 60°C	50°C		
			Zone2 outdoor ambient temp *1	−15°C - +35°C	–15°C		
			Zone2 flow temp *1	25°C - 60°C	40°C		
		Lo set point	Zone1 outdoor ambient temp	−15°C - +35°C	35°C		
			Zone1 flow temp	25°C - 60°C	25°C		
			Zone2 outdoor ambient temp *1	−15°C - +35°C	35°C		
			Zone2 flow temp *1	25°C - 60°C	25°C		
		Adjust	Zone1 outdoor ambient temp	−14°C - +34°C	—		
			Zone1 flow temp	25°C - 60°C	—		
			Zone2 outdoor ambient temp *1	−14°C - +34°C	—		
			Zone2 flow temp *1	25°C - 60°C	—		
	Holiday		DHW *3	Active/Non active	Non active		
			Heating/Cooling *2	Active/Non active	Active		
			Zone1 heating room temp	10°C - 30°C	15°C		
			Zone2 heating room temp *1	10°C - 30°C	15°C		
			Zone1 heating flow temp	25°C - 60°C	35°C		
			Zone2 heating flow temp *1	25°C - 60°C	25°C		
			Cooling flow temp *2	5°C - 25°C	25°C		
	Initial settings		Language	ENG/FR/GER/SW/SP/IT/DA/NL/FIN/NOR/PT	ENG		
			°C/°F	°C/°F	°C		
			Temp. display	Room/DHW tank/Room&DHW tank /Off	Off		
			Time display	hh:mm/hh:mm AM/AM hh:mm	hh:mm		
			Room sensor settings for Zone1	TH1/Main RC/Room RC1-8/"Time/Zone"	TH1		
			Room sensor settings for Zone2 *1	TH1/Main RC/Room RC1-8/"Time/Zone"	TH1		
			Room RC zone select *1	Zone1/Zone2	Zone1		

*1 The settings related to Zone2 can be switched only when Zone2 temperature control is enabled (when Dip SW2-6 and SW 2-7 are ON).
*2 Cooling mode settings are available for ERSC-VM2B only.
*3 Only available if DHW tank present in system.

Engineers Forms (2/2)

Commissioning/Field settings record sheet (continued from the previous page)

Main controller screen				Parameters			Default setting	Field setting	Notes
Setting	Service menu	Thermistor adjustment	THW1	−10°C - +10°C			0°C		
			THW2	−10°C - +10°C			0°C		
			THW5	−10°C - +10°C			0°C		
			THW6	−10°C - +10°C			0°C		
			THW7	−10°C - +10°C			0°C		
			THW8	−10°C - +10°C			0°C		
			THW9	−10°C - +10°C			0°C		
			THWB1	−10°C - +10°C			0°C		
			THWB2	−10°C - +10°C			0°C		
		Auxiliary settings	Economy settings for pump	On/Off			On		
				Time before pump switched off (3 - 60 mins) *4			10 mins		
			Electric heater (Heating)	Space heating: On (used)/Off (not used)			On		
				Electric heater delay timer (5 - 180 mins)			30 mins		
			Electric heater (DHW) *3	DHW: On (used)/Off (not used)			On		
				Electric heater delay timer (15 - 30 mins)			15 mins		
			Mixing valve control	Running time (10 - 240 secs)			120 secs		
				Interval (1 - 30 mins)			2 mins		
			Pump speed	Pump speed (1 - 5)			5		
		Heat source setting		Standard/Heater/Boiler/Hybrid *5			Standard		
		Operation settings	Freeze stat function	Outdoor ambient temp. (3 - 20°C)			5°C		
			Simultaneous operation (DHW/ Heating)	On/Off *6			Off		
				Outdoor ambient temp. (−15 - +10°C)			−15°C		
			Cold weather function	On/Off *6			Off		
				Outdoor ambient temp. (−15 - −10°C)			−15°C		
			Room temp control (Heating)	Temp. control interval (10 - 60 mins)			10 mins		
				Flow temp. range	Min. temp. (25 - 45°C)		30°C		
					Max. temp. (35 - 60°C)		50°C		
				Heat pump thermo diff. adjust	On/Off *6		On		
					Lower limit (−9 - −1°C)		−5°C		
					Upper limit (+3 - +5°C)		5°C		
			Boiler operation	Hybrid settings	Outdoor ambient temp. (−15 - +10°C)		−15°C		
					Priority mode (Ambient/Cost/CO_2)		Ambient		
				Intelligent settings	Energy price *7	Electricity (0.001 - 999 */kWh)	0.5 */kWh		
						Boiler (0.001 - 999 */kWh)	0.5 */kWh		
					CO_2 emission	Electricity (0.001 - 999 kg -CO2/kWh)	0.5 kg -CO2/kWh		
						Boiler (0.001 - 999 kg -CO2/kWh)	0.5 kg -CO2/kWh		
					Heat source	Heat pump capacity (1 - 40 kW)	11.2 kW		
						Boiler efficiency (25 - 150%)	80%		
						Booster heater 1 capacity (1 - 20 kW)	2 kW		
						Booster heater 2 capacity (1 - 20 kW)	4 kW		
			Floor dry up function	On/Off *6			Off		
				Target temp.	Start&Finish (25 - 60°C)		30°C		
					Max. temp. (25 - 60°C)		45°C		
					Max. temp. period (1 - 20 days)		5 days		
				Flow temp. (Increase)	Temp. increase step (+1 - +10°C)		+5°C		
					Increase interval (1 - 7 days)		2 days		
				Flow temp. (Decrease)	Temp. decrease step (−1 - −10°C)		−5°C		
					Decrease interval (1 - 7 days)		2 days		
		External input settings	Demand control (IN4)	Heat source OFF/Boiler operation			Boiler operation		
			Outdoor thermostat (IN5)	Heater operation/Boiler operation			Boiler operation		

*4 Decreasing “time before pump switched off” may increase the duration of stand-by in Heating mode.
*5 When Dip SW1-1 is set to OFF “WITHOUT Boiler” or SW2-6 is set to OFF “WITHOUT Mixing tank”, neither Boiler nor Hybrid can be selected.
*6 On: the function is active; Off: the function is inactive.
7 “” of “*/kwh” represents currency unit (e.g. € or £ or the like)

13-2. Annual Maintenance Log Book

Contractor name		Engineer name	
Site name		Site number	
Hydrobox maintenance record sheet			
Warranty number		Model number	
		Serial number	

No.	Mechanical	Frequency	Notes	
1	Isolate and drain hydrobox, remove mesh from internal strainer clean and replace.			
2	Open the pressure relief valve, check for unrestricted discharge to the tundish and that the valve reseats correctly. Check there are no blockages in the tundish and associated pipe work.			
3	Drop the primary/heating system pressure to zero check and if necessary top up the expansion relief vessel (1 bar). Air valve of expansion vessel is TR-412.			
4	Check and if necessary top up the concentration of anti-freeze/inhibitor (if used in the system).			
5	Top up the primary/heating system using an appropriate filling loop and re-pressurise to 1 bar.			
6	Heat system and check pressure does not rise above 3 bar and no water is released from the safety valves.			
7	Release any air from the system.			
	Refrigerant models only [EXCEPT EHPX]	Frequency	Notes	
1	Refer to outdoor unit manual.			
	Electrical	Frequency	Notes	
1	Check condition of cables.			
2	Check rating and fuse fitted on the electricity supply.			
	Controller	Frequency	Notes	
1	Check field settings against factory recommendations.			
2	Check battery power of wireless thermostat and replace if necessary.			

Outdoor heat pump unit maintenance record sheet			
Model number		Serial number	

	Mechanical	Frequency	Notes	
1	Inspect grill, heat exchanger fins and air inlet for trapped debris/damage.			
2	Check condensate drain provision.			
3	Check integrity of water pipe work and insulation.			
4	Check all electrical connections.			
5	Check and record the operation voltage.			

* All the above checks should be carried out once a year.

Note:
Within the first couple of months of installation, remove and clean the hydrobox's strainer plus any that are fitted external to the hydrobox. This is especially important when installing on an existing system.

In addition to annual servicing it is necessary to replace or inspect some parts after a certain period of system operation. Please see tables below for detailed instructions. Replacement and inspection of parts should always be done by a competent person with relevant training and qualifications.

Parts which require regular replacement

Parts	Replace every	Possible failures
Pressure relief valve (PRV) Air vent (Auto/Manual) Drain cock (Primary circuit) Flexible hose Manometer	6 years	Water leakage due to brass/copper corrosion (Dezincification)

Parts which require regular inspection

Parts	Check every	Possible failures
Immersion heater	2 years	Earth leakage causing circuit breaker to activate (Heater is always OFF)
Water circulation pump	20,000 hrs (3 years)	Water circulation pump failure

Parts which must NOT be reused when servicing
* O-ring
* Gasket

Note:
Always replace the gasket for pump with a new one at each regular maintenance (every 20,000 hours of use or every 3 years).

MITSUBISHI ELECTRIC CORPORATION

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